FLIGHT

MAGAZINE

AUGUST 1956

50 cents

TECHNOLOGY DEPT.

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DETROIT

Combat commuter –

at 8 second intervals

In recent tests duplicating actual assault landings, Fairchild C-123's gave dramatic evidence of performance under combat conditions.

The target – a rough, ungraded field – was ringed by "hostile" forces. Heavily laden, the C-123's approached the field at 500 ft. altitude – too low for heavy A.A. guns, too high for small-arms fire. Just short of their touchdown point, the highly maneuverable assault transports swept down, flaring out just as they flashed over the clearing's edge. Two minutes later, twelve C-123's had rolled to a halt – troops and trucks were fanning out to their assigned positions. The C-123's had landed at *8 second intervals!*

This dramatic demonstration of pilot and crew proficiency was made possible by C-123 maneuverability, short field performance and utter reliability – all three, features of Fairchild aircraft designs.

FAIRCHILD

AIRCRAFT DIVISION • HAGERSTOWN 10, MARYLAND

A Division of Fairchild Engine and Airplane Corporation

...WHERE THE FUTURE IS MEASURED IN LIGHT-YEARS!

Lands on a half-dollar
with help worth a million!

Highly effective equipment in the constant quest for black gold are the massive off-shore oil drilling rigs, now operating in several Gulf of Mexico locations. On these, crews are living and working many miles from shore largely because of the Bell helicopter.

Here, time is *big* money. Supplies and emergency repair parts must be brought in fast. The ability of the Bell helicopter to use a drilling rig platform, 14 feet square, as an "airport" makes it a priceless ally . . . a speedy, practical, safe link with the mainland in all kinds of weather. Floats for over water operation are interchangeable with standard skid gear.

The petroleum industry has developed many other profitable uses for Bell helicopters . . . in exploration, in pipe line construction and maintenance, in fast movement between installations. *Let us send you full details.*

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Aircraft CORP.

Sales Manager, Dept. 4A
TEXAS DIVISION
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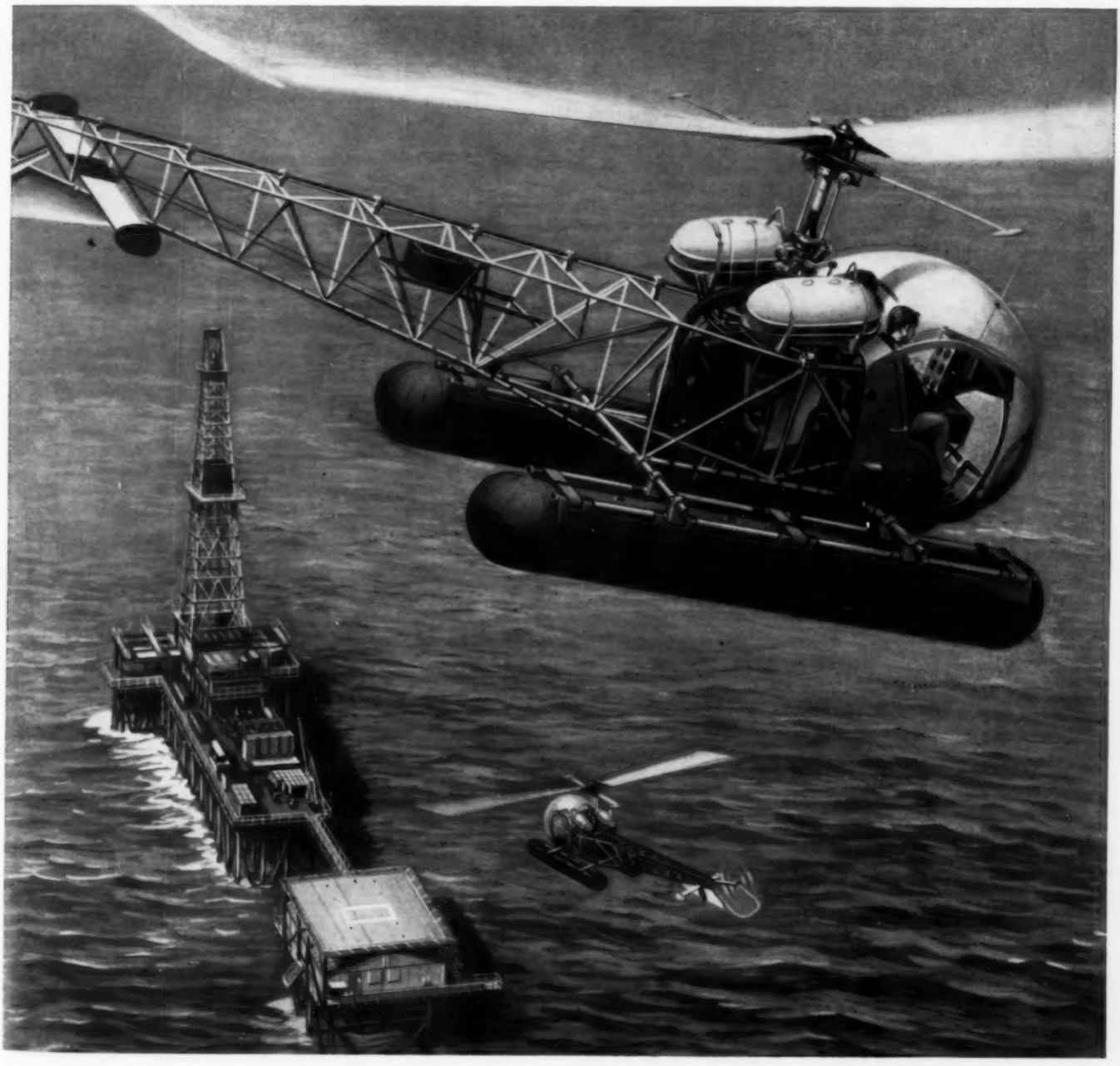


Phillips 66
PRESENTS
MILESTONES IN AVIATION

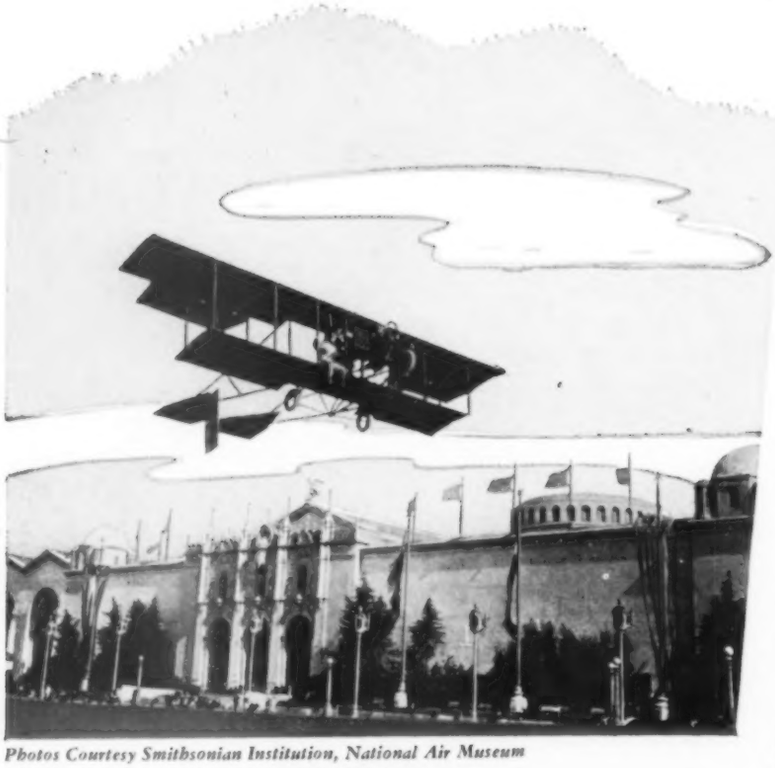
Bird Boy Art Smith

Whenever daring exploits of pioneer aviators are chronicled, the name of Bird Boy Art Smith is sure to appear. From the time he flew his first Curtiss-type biplane in 1911 until his death in 1926, Art Smith dedicated his life to aviation.

The romance of his life was heightened by the unselfish encouragement of his mother and father, who mortgaged their home so that their son could have the money to build his first airplane. Another inspiration of his early years was his sweetheart, Aimee Cour. They eloped in 1912 in what is considered to be the world's first airplane elopement.

Flying in such places as Deadwood, S. Dakota, and in the capital of Japan, Art Smith set the world record for looping the loop, pioneered sky writing and invented dozens of breath-taking stunts to win acclaim of millions throughout the world.

The custom of showing admiration for Art Smith's flying by giving him a medal started with a flight he made in the Black Hills in 1912. One of his most prized awards was a gold nugget, given him by his hero, Buffalo Bill.



Photos Courtesy Smithsonian Institution, National Air Museum

It's Performance that Counts!

A pioneer in research and manufacturing to meet aviation needs, Phillips Petroleum Company continues its leadership as a supplier of high octane gasoline and new *super performance* Jet Fuels for today's aircraft.

Since aviation's early days, Phillips has taken an active part in setting up higher standards for aviation fuel. In fact, Phillips pioneered in producing such important Avgas components as HF Alkylate and Di-isopropyl.

In aircraft fuels, it's performance that counts. And military and commercial operators know they get *super* performance from Phillips 66 products.

AVIATION DIVISION
PHILLIPS PETROLEUM COMPANY
BARTLESVILLE, OKLAHOMA

Phillips 66
AVIATION PRODUCTS

AIR Report

Significant Trends and News

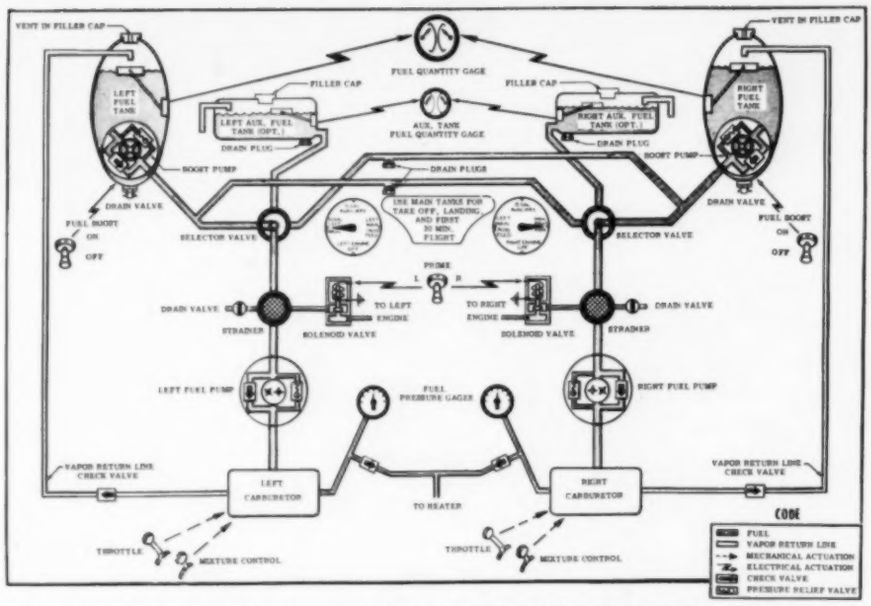
H.R. 5738 FOR COLLEGE ROTC FLIGHT TRAINING was passed before Congress adjourned last month but the National Aviation Trades Association has warned private flight schools not to become over-optimistic as the ROTC program will be limited during the first year.

NEW 4-PLACE TWIN-ENGINE BEECHCRAFT BADGER will fly in August as the biggest surprise of the year in business aircraft manufacturing and marketing. Badger is powered by two Lycoming 4-cylinder engines rated at 180 hp. It presumably is produced with 4-place Bonanza and Mentor tooling and parts and horsepower indicate it will gross close to 4,000 lbs. and cruise at close to 200 mph. This would place the small Beech about half way between the Piper Apache and the Cessna 310 in price and close to the Cessna 310 in speed and single-engine performance. The Badger name can be accepted as promising a competitive scrap by Beech for a greater share of the small-twin market — the Badger is a rough and tough scrapper and will be fast in a fight. Badger development has not been a secret but the surprise is the rapidity with which it has been brought to flight-test stage. Watch for all-out sales drive by Beech and intense effort to expedite volume production and deliveries early in 1957.

HELIO AIRCRAFT CORP. has acquired for $1,000,000 the plant and organization of Mid-States Manufacturing Co., Pittsburg, Kansas, which has been producing 4-place Helio Couriers under contract and aircraft components for other manufacturers. Lynn L. Bollinger, Helio president, said about half the purchase price was paid in the form of Helio stock, the rest in notes. Helio is headquartered at Norwood, Mass., and its chief engineer, Lawrence N. Smithline, says the firm has successfully flown a more radically-designed STOL (short take-off and landing) aircraft using more high-lift features.

COURT SUIT TO HALT CONSTRUCTION OF A PROPOSED MUNICIPAL AIRPORT at York, Pennsylvania, has been filed by Oscar L. Hostetter, whose private commercial airport is less than 2 miles from the site of the planned $4,000,000 facility. A former NATA president, Hostetter says his paved 4,200-ft. runway and a 1,980-ft. sod cross-runway, which can be extended when needed, adequately serve York and claims it is illegal under Pennsylvania law to use public funds to build a facility which would compete with private enter-

(Continued on page 8)



THIRTY PER CENT MORE FUEL FOR THE TWIN-ENGINE CESSNA 310 is available from a new auxiliary fuel system announced by Sales Manager Frank Martin. Two 15-gal. auxiliary rubber tanks are located inside the wing between the spars outboard of each engine, and connected as illustrated in this diagram of the 310's fuel system. The new system is optional at $1,485, weighs 16 lbs. Standard 310 fuel is 100 gals.

FLIGHT MAGAZINE

AUGUST, 1956 VOL. 45, No. 8

THIS MONTH'S COVER presents a new portrait of the fast little Temco Model 51, which won the Navy's recent competition and has been ordered as its first jet primary trainer, designated TT-1. Temco's first complete aircraft design to go into production, it is powered by a 920-lb.-thrust Continental J69 turbo jet and has a top speed of 300 knots. Fourteen are being produced, with first deliveries next summer. —(Temco Photo.)

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Just Among Ourselves—EDITORIALS: CESSNA MAKES PROGRESS WHILE DREAMERS GAB; LEST WE FORGET 19

Temco TT-1, First Navy Light Jet Trainer—NEW PHOTOS OF TEMCO'S FIRST PRODUCTION DESIGN 26

First Collins Radar in New Beech Super 18—DETAILS OF COLLINS WP-101 WEATHER RADAR SYSTEM 28

Maximizer Gives DC-3 20 Mph. More Speed—NEW AIRESEARCH SPEED KIT OFFERS GUARANTEED PERFORMANCE GAINS 30

Pressurized Cessna Ready for Flight—BY TOM ASHLEY—FIRST PHOTOS OF THE 4-ENGINE MODEL 620 BUSINESS TRANSPORT . 32

Miami Maintenance Center—A VISIT TO L. B. SMITH AIRCRAFT CORP. 36

Low And Slow—BY DICK DOYLE—CROSS-COUNTRY EXPERIENCES IN A BUSINESS COPTER 40

Questions and Answers for Airport Operators 48

GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; E. H. PICKERING, Consultant; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas—Telephone TEnison 6191.

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DARE announces its new...

360 Channel VHF Transceiver

with 15-watt Transmitter Output

A new DARE Communications transceiver, born of consumer demand, and developed to maximum usability by DARE engineers is now ready. The new DTR-360 features great compactness, with maximum power and sensitivity. Moderately priced, it is ideal for executive, corporate, military or transport requirements. The entire unit, including dynamotor is built on a ½ ATR frame, mounted for maximum protection on latest type metal-mounts.

Look over the specifications. Then ask your DARE distributor to tell you more about this fine product.

Brief Specifications

Receiver Sensitivity—2 microvolts or better for 150 milliwatt output. Highly selective circuit employs double conversion. Audio output up to 8 watts for loud and clear speaker reception or headphone use. Adjustable squelch.

Transmitter—Power Output at least 15-watts on any channel. Frequency stability .01% or better. Eight ruggedized tubes.

Power Supply—Dependable dynamotor type. Two voltage regulator tubes provide drift free operation of all critical circuits. 14 or 28 volt input, as desired. Also includes transmitter modulator and receiver power output stages.

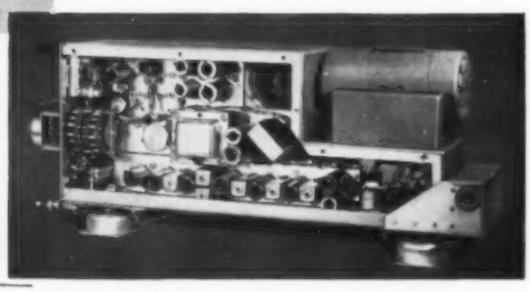
Physical—(with shock mount) Overall size 9⅜" high x 23¾" long x 5" wide. Net weight 24 lbs. complete.

180 or 360 Channel Operation—Available for either 180 or 360 channels. On 180 operation you get a crystal controlled channel every 100 kilocycles all the way from 118.0 megacycles to 135.9 megacycles. On 360 channel operation you have a crystal channel every 50 kilocycles over the same range.

Simplex or Cross Channel (Duplex) Operation—With a single DARE backlighted control you receive and transmit on the same selected channel. With two DARE controls you can receive and transmit on different channels, if you so desire.

Economical Crystal Saver Circuit—DARE engineering has devised a unique circuit requiring only ten frequency wires to connect the control to the transceiver. Only 38 crystals are required for 180-channel operation and only 58 for 360 channel.

Easy on the serviceman, too—The new DTR-360 was designed for economical servicing. The entire unit is "unitized," has separate chassis for receiver, transmitter, and power supply elements. All tube testing and service alignment can be done from one side, which is easily accessible. Front panel jacks make transmitter metering easy.



See your Dare Distributor or write . . .

DARE, INC.
TROY, OHIO

New DARE DTR-360 Transceiver

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Butler Aviation
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Safair Flying Service, Inc.
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Akron, Ohio

Dayco Products
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Interstate Airmotive Hangar
St. Louis, Missouri

Des Moines Flying Service
Municipal Airport
Des Moines, Iowa

Executive Aircraft Corp.
Municipal Airport
Pontiac, Michigan

Great Lakes Airmotive
Willow Run Airport
Ypsilanti, Michigan

Midwest Airways, Inc.
General Mitchell Field
Milwaukee, Wisconsin

Minnesota Airmotive, Inc.
Wold Chamberlain Field
Minneapolis, Minn.

Skymotive, Inc.
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Park Ridge, Illinois

Southern Ohio Aviation Co.
Dayton Municipal Airport
Vandalia, Ohio

Topeka Piper Sales
Municipal Airport
Topeka, Kansas

Walston Aviation Company
Memorial Airport
East Alton, Illinois

Youngstown Airways
Municipal Airport
Youngstown, Ohio

SOUTHEAST

Aircraft Radio Service
Byrd Airport
Sandston, Virginia

Cannon Aircraft Sales & Service
Cannon Airport
Charlotte, North Carolina

Southern Aero Radio, Inc.
Municipal Airport
Atlanta, Georgia

SOUTH

Air-Tronics Company
New Orleans Municipal Airport
New Orleans, Louisiana

Memphis Aero
Municipal Airport
Memphis, Tennessee

SOUTHWEST

Aircraftsmen, Inc.
Will Rogers Field
Oklahoma City, Oklahoma

Associated Radio, Inc.
3508 Love Field Drive
Dallas, Texas

Faulkner Air Radio
Municipal Airport
Houston 17, Texas

Howard Aero Service
International Airport
San Antonio, Texas

West Texas Flying Service
Midland Air Park
Midland, Texas

WEST

Bayaire Avionics
Oakland International Airport
Oakland, California

Denver Airplane Supply
Division of Clinton Aviation
Stapleton Airfield
Denver, Colorado

Flightcraft, Inc.
Portland International Airport
Portland, Oregon

Qualitron, Inc.
2945 Hollywood Way
Burbank, California

Santa Monica Aviation
Santa Monica Airport
Santa Monica, California

Skycrafters Aviation Radio
Long Beach Muncipal Airport
Long Beach, California

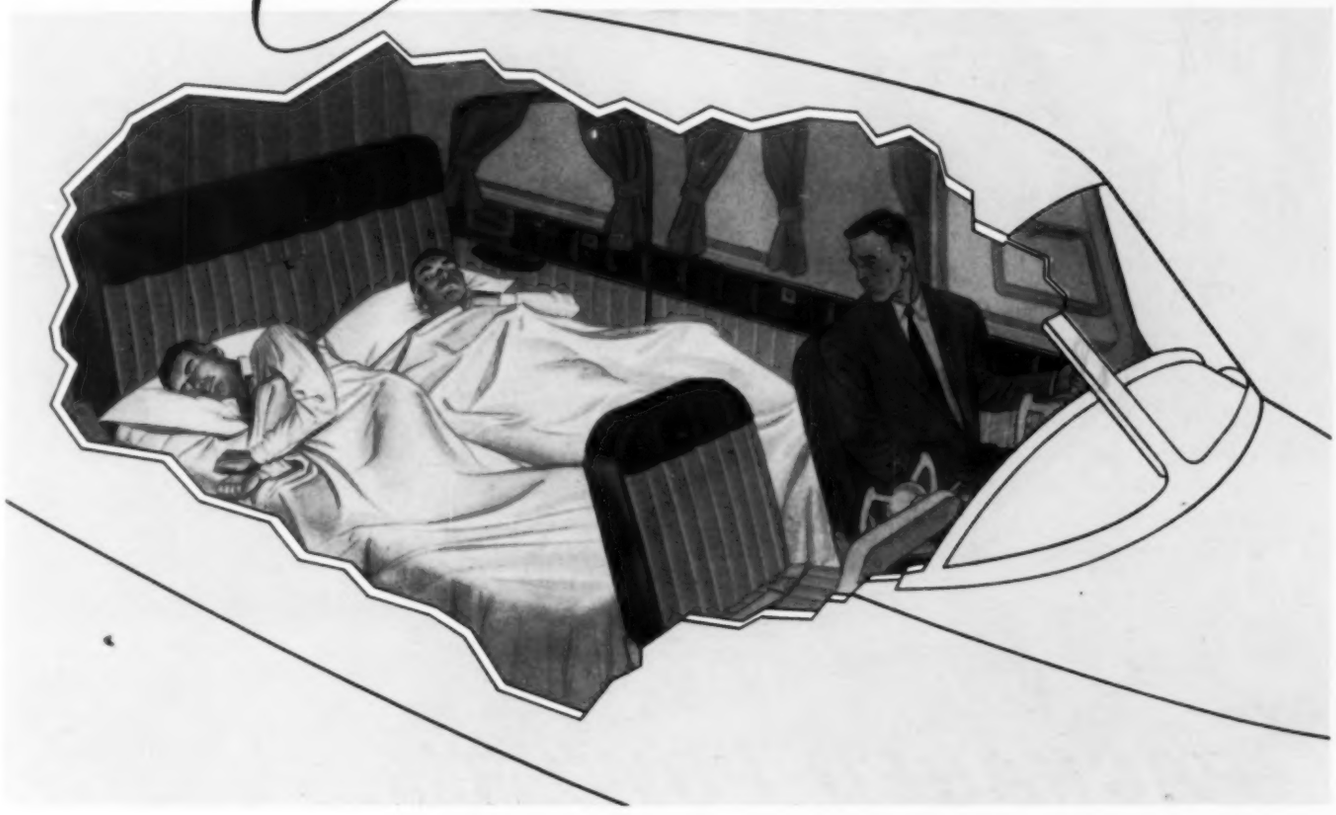
Sun Valley Air Service
Sky Harbor Airport
Phoenix, Arizona

CANADA

Technical Enterprises Ltd
Malton Airport
Malton, Ontario, Canada

IN BOTH GREAT

Commanders



"Room To Be Comfortable"

Twin-bed comfort is but one of the flexibility features made possible by longer, roomier cabins of both great Commanders. The optional hassock may be adjusted in seconds to provide a seat back, a chaise lounge or a comfortable bed for the flying executive.

One Easy Step...

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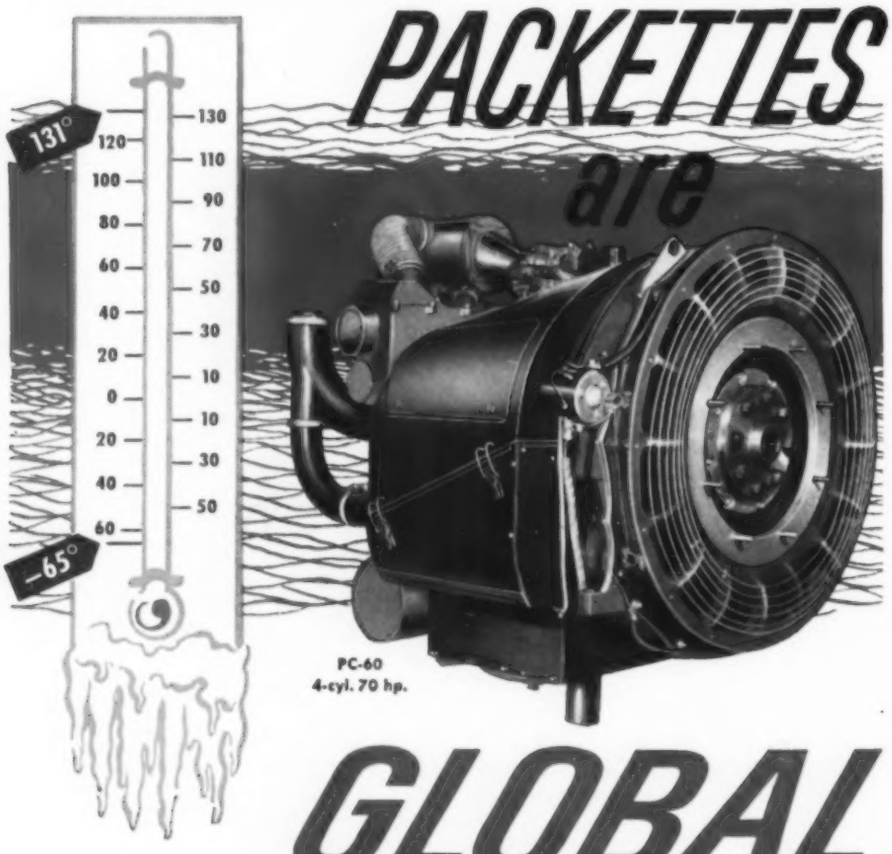
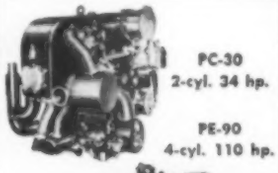
these CONTINENTAL PACKETTES are GLOBAL PACKAGED POWER



PC-60
4-cyl. 70 hp.

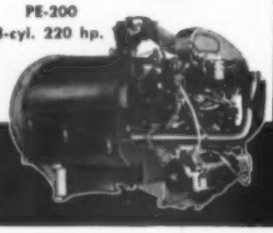


PC-30
2-cyl. 34 hp.

PE-90
4-cyl. 110 hp.

PE-150
6-cyl. 175 hp.

PE-200
8-cyl. 220 hp.



These five all-climate Packettes, the standard package power plant for all types of ground service equipment, provide output from 34 to 220 hp, in combination with that dependability which has made Continental aircraft engines pilots' first choice. Automatically governed by the applied load, for any specific application. These power plants offer wide interchangeability of parts with the basic models from which they are developed. Those with prospective need for compact, dependable power, engineered to operate under equatorial heat or at 65° below zero, are invited to write for information.

●

CAREERS FOR ENGINEERS

Continental Motors and its subsidiaries have numerous openings for engineering personnel interested in challenging careers in gas turbine and reciprocating engine development. For information, address Engineering Personnel Department, 12800 Kercheval Ave., Detroit 15, Michigan.

Powers the Nation — America's Standard — TM REG.

Continental Motors Corporation
Aircraft Engine Division
MUSKEGON, MICHIGAN

AIR REPORT

(Continued from page 5)

prise. Further, he said the new field would create a safety hazard and would be used by military jets of the Air Guard.

CESSNA HAS DELIVERED ITS 1,000TH MODEL 172 since the tricycle high-wing went into production only 8 months ago. It went to Ward and Ralph McDowell, Ft. Worth, along with a gold key from Dwane Wallace, Cessna president.

CAPITAL AIRLINES HAS PURCHASED 14 DE HAVILLAND COMET 4A JET AIRLINERS from the British manufacturer for $53,000,000 with deliveries beginning in late 1958 for first scheduled services early in 1959, making Capital the first U. S. airline to operate jet schedules. American Airlines' first Boeing 707 schedules are scheduled for mid-1959. Comet 4A, powered by four Rolls Royce Avon jets, carries 74 passengers at 545-mph. cruising speed.

CESSNA'S 4-PLACE CH-1 HELICOPTER IS GOING ON THE COMMERCIAL MARKET with production soon and deliveries in 1958. Sales Manager Frank Martin said both pricing and marketing plans are yet to be finalized.

Airmen's Calendar

Aug. 15-17—IAS National Turbine-Powered Air Transportation Meeting, Grand Hotel, San Diego.

Aug. 22-24—1956 Bendix Ignition Conference, Sidney, N. Y.

Aug. 20-22—National Flying Farmers Association Convention, Hotel Roosevelt, New Orleans.

Sept. 1-3—National Aircraft Show, Oklahoma City.

Sept. 6—7th Annual Airwork-P&W Engine Forum, Millville, N. J.

Sept. 9-11—20th Annual Northwest Aviation Council International Convention, Boise, Idaho.

Sept. 10—Annual Southwest Airmotive-P&W Engine Forum, Melrose Hotel, Dallas.

Sept. 10-15—API Aviation Technical Service Committee, Melrose Hotel, Dallas.

Sept. 13—7th Annual Airwork-P&W Engine Forum, Miami Springs, Fla.

Sept. 14-15—Conference on Communications, Roosevelt Hotel, Cedar Rapids, Iowa; Details from R. T. Arcaud, Publicity Chairman, P. O. Box 948, Cedar Rapids.

Sept. 27-28—4th Michigan Aeronautics Conference, Manistee.

Oct. 3-4—7th Annual National Airports Conference, University of Oklahoma, Norman; Details from Joe Coulter, Max Westheimer Field, Norman, Okla.

Oct. 7-9—3rd Annual American Helicopter Society Western Forum, Adolphus Hotel, Dallas.

Oct. 17-18—8th Annual Indiana Aviation Conference, Turkey Run State Park.

Oct. 24-26—9th National Business Aircraft Assoc. Meeting, Miami.

Temco's new jet wins Navy Wings

The U. S. Navy has selected Temco Aircraft's sleek Model 51 as its first jet primary trainer. Filling its role in a new concept for primary training, the two-place aircraft will give Navy pilots of the future flight training that actually begins in a jet.

Designed, built and flight-tested by Temco at its own expense, the Model 51 now becomes the Navy's TT-1, after its selection in competitive flight evaluation tests at the Navy's Patuxent River Air Test Center.

The TT-1, basically designed to shorten the number of flying hours for military flight training, combines the flight characteristics of true jet performance with the safety features that student pilots need.

ENGINEERS

Openings in all phases of aircraft design and development; write to Engineering Personnel, Temco Aircraft Corp., Dallas, Texas

DALLAS TEMCO AIRCRAFT CORPORATION

CESSNA DELIVERIES HAVE ALMOST EQUALLED COMBINED TOTALS FOR THE REST OF THE LIGHTPLANE INDUSTRY during the first half of 1956, with Cessna delivering 1,776 aircraft as compared to 1,803 for six other manufacturers reporting in the Aircraft Industries Association's Utility Aircraft Council. At the half-year mark, billings for lightplane shipments totalled $53,979,000, of which Cessna's share was $20,901,000. By make and model, first-half shipments have been Aero Design 63 (33 Model 560A, 30 Model 680); Beech 402 (271 Bonanzas, 6 Model 18, 53 Model E18, 67 Twin-Bonanza, 5 export Model 45 Mentor); Call Air 9 Model A4; Cessna 1,776 (65 Model 170B, 754 Model 172, 341 Model 180, 485 Model 182, 5 Model 195B, 124 Model 310 and 2 Model 325 liaison); Mooney 39 (7 Model 18, 32 Model 20); Piper 1,273 (396 Super Cub, 658 Pacer and Tri-Pacer and 219 Apache), and Taylorcraft 17 Model 20; total for 7 manufacturers, 3,579 aircraft shipments. These figures include 572 twins, indicating close to 1,000 twin-engine business planes will be delivered during all of 1956 if the rate continues.

AERO CORP. OF ATLANTA has received an Air Force contract to overhaul 48 additional Cessna L-19 liaison planes.

NEW EXECUTIVE DIRECTOR AND SECRETARY of the National Business Aircraft Association is William K. Lawton, New York University journalism graduate, commercial pilot, airline dispatcher and recently public relations director of L. B. Smith Aircraft Corp., Miami. Lawton succeeds Jean H. DuBuque, resigned on July 31.

OVER 60 PILOTS FROM 30 STATES AND 5 FOREIGN COUNTRIES are competing in the 23rd National Soaring Contest July 31-Aug. 9 at Grand Prairie near Dallas, with the Texas Soaring Association as host.

PRODUCTION OF NARCO RADIOS IS BEING DOUBLED after opening last month of National Aeronautical Corporation's new Fort Wash-

there's a doctor in the house

at Aero of Atlanta!

An extra service offered by Aero of Atlanta is X-ray inspection of multi-engine aircraft. Personalized attention is given each job *inside* and *out*. The combination of skilled, experienced personnel and complete facilities insures satisfactory work. You can have confidence in any job done by Aero of Atlanta.

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Engineering	X-ray
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Overhaul	Hydraulics
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Factory Approved Collins — ARC

X-ray of tank area of the executive type B-23 shown above is one of 45 pictures made during X-ray inspection at Aero Corporation facilities in Atlanta.

For further information call or write
Tom Lombardo • Ray Beck

AERO CORPORATION

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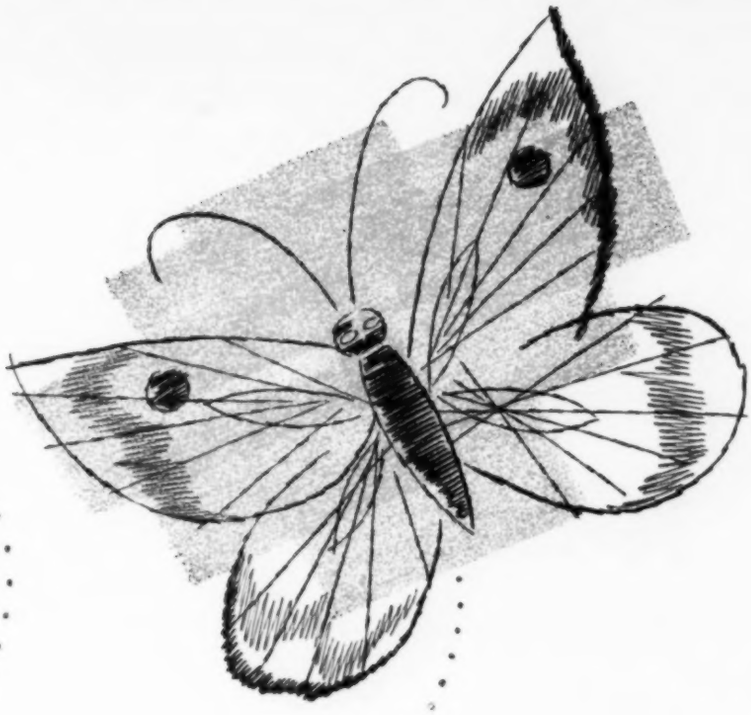
FIRST IN HELICOPTER OVERHAUL

4TH ANNUAL TRANSCONTINENTAL AIR CRUISE from Phoenix to Philadelphia, sponsored by Philadelphia Jaycees, was won recently by Mrs. Faye Douthitt of El Centro, Calif., shown with her husband (right) and Cruise Chairman G. H. Baughman, Jr. (left) and Jaycee President Lee Sacks. In a Navion, she was 20 points higher than the nearest competitor, winning both the cruise and Navion trophies.



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FOR
FLIGHT

ARC's new ADF weighs less than 20 lbs!

TYPE 21 ADF WEIGHS ONLY 19.7 POUNDS

Component Units Weights: Receiver, 6.8 lbs.; Loop, 4.3 lbs.; Loop Housing, 0.5 lbs.; Control Unit, 1.6 lbs.; Indicator, 1.3 lbs.; Power Unit, 5.2 lbs.
CAA Type Certificated

Fly light and navigate . . . better than ever before!

ARC's miniaturized Automatic Direction Finder is making aviation news. It offers *reliability* proved in two years of testing. The entire system weighs less than 20 pounds. Now you can have a DUAL installation where required—at a weight saving of 80 pounds or more.

The ADF still is the world's Number One navigational aid, usable on an estimated 60,000 radio stations. Now you can have ADF featuring ARC standards of performance and reliability. This system incorporates hermetic sealing of critical components such as the entire loop assembly. It also has other mechanical features designed and tested for dependability under today's higher speeds and more exacting operational and environmental conditions.

The Type 21 ADF covers all frequencies from 190 kc to 1750 kc. It requires less power—only 2.8 amps at 27.5 volts dc input. Extremely low drag of the loop is an outstanding feature. Housing extends only 2 inches from the skin of the aircraft.

Now make room for more payload and other equipment. Fly with ARC-reliability, less weight, less space, less drag. Ask your dealer for complete details.

Omni/ILS Receivers • Course Directors • UHF and VHF Receivers and Transmitters
LF Receivers and Loop Direction Finders • 10-Channel Isolation Amplifiers • 8-Watt Audio Amplifiers • Interphone Amplifiers • Omnirange Signal Generators and Standard Course Checkers • 900-2100 Mc Signal Generators

Dependable Airborne Electronic Equipment Since 1928

ARC **Aircraft Radio Corporation** BOONTON, NEW JERSEY

ington (Pennsylvania) factory, two miles from Wings Field at Ambler.

NEW BUSINESS AIRCRAFT SERVICE CENTER AT POMPANO BEACH, FLORIDA, has been opened by Remmert-Werner and will feature facilities similar to the firm's bases at St. Louis and Toledo, offering complete maintenance, conversion, inspection, overhaul and 24-hr. line service for DC-3, Convair, Lodestar, Twin Beech and other aircraft. Emphasis will be on facilities for pilots, crews and passengers while their aircraft are being serviced. The airport itself has an 18-hole golf course, swimming pool, clubhouse, restaurant, lounge and other accommodations. Ft. Lauderdale is only 12 miles away.

CONTINUED BRIGHT OUTLOOK FOR BUSINESS FLYING is shown in results of Piper Aircraft's latest annual survey of several thousand Piper owners sent questionnaires. Sales Manager J. W. Miller reported his findings as follows: 95.7% of all Tri-Pacer owners regard the airplane as a necessary part of business and private life and 88% report their businesses have expanded as a direct result of aircraft use. Twin-engine Apache owners agree 100% that the airplane is and will continue to be essential, 54.5% of them crediting their planes with increasing their business. Fifty-nine per cent of

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Stearman Back After Playing Wrong Cards

By TOM TOWERS

Pioneer Aircraft Manufacturer Lloyd G. Stearman has returned to Lockheed Aircraft Corp., which he headed as president in 1932-34, *as a production design engineer because "great things are happening in aviation and I want to be a part of this fabulous business once again." He rejoins Robert E. Gross, Lockheed president, and Hall Hibbard, engineering vice president, both of whom were with a Stearman enterprise back in the late 20's at Wichita, where Stearman organized Stearman Aircraft on a* $60,000 *bankroll supplied by Walter Innes.*

"Bob Gross walked in one day wondering if we could use additional capital," Stearman recalls. "He was in the investment banking business in Boston. I took him up and he arranged to place $750,000 *in our business. Hall Hibbard later came down from Boston as an engineer for* $80 *per month."*

Stearman was then producing a 220-*hp. biplane favored by fledgling airlines and mail pilots. Stearman Aircraft merged in* 1929 *with a United Aircraft and Transport Co. syndicate and Lloyd resigned two years later, moving to Alameda, Calif., where he opened an aircraft design shop with Gross and Pioneer Walter Varney. This venture was abandoned in late* 1931 *when the three purchased Lockheed for* $40,000 *in bankruptcy, Stearman serving a* 2-*year term as president before resigning to set up another aircraft firm in South San Francisco with Dean Hammond. This firm folded in the* 1937-38 *recession.*

The famous Stearman trainer Lloyd designed was manufactured by Boeing at Wichita while Stearman worked for Harvey Machine Co. in Los Angeles as head of its aviation parts department. "Some will say I didn't play my cards right when I had the chance," Lloyd says. "But I have no regrets. I could have been rich had I bought and sold aircraft stocks at the right time. A little struggle in life has never hurt anyone."

For the last 5 *years he has worked in Dos Palos, Calif., operating a farm machinery sales and repair business.*

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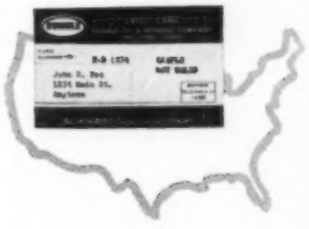

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NEW GENERAL AVIATION FACILITIES PLANNING GROUP is shown in Washington before beginning a fact-finding study for Edward P. Curtis, President Eisenhower's special assistant for aviation facilities planning. From left to right at the head table is the group's executive committee — Dwight P. Joyce, Dwane L. Wallace, General Chairman George E. Haddaway and Executive Committee Chairman Leslie A. Bryan. Organizations represented at the meeting included Aeronautical Training Society, American Association of Airport Executives, Aircraft Distributors and Manufacturers Association, Aircraft Owners and Pilots Association, National Association of State Aviation Officials, National Business Aircraft Association, National Flying Farmers Association, National Pilots Association, and Utility Airplane Council.

Royal AMPHIBIAN NEWS

Notes on America's outstanding utility amphibian for business flying and charter service operation

Royal Gull Supports "DEW" Line Airlift

Pictured above is a Royal Gull, purchased by Geolaire of Toronto, Ontario, Canada, for use in transporting men and high value radar equipment to Distant Early Warning construction centers. Flying in subzero temperatures, landing in rough waters in the Arctic Ocean and on short gravel strips is "all in a day's work" for this rugged, high performance 5-place twin engine amphibian.

If you'd like to know how the Royal Gull fits into your air-transport picture, write direct —

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A subsidiary of Kearney & Trecker Corp.

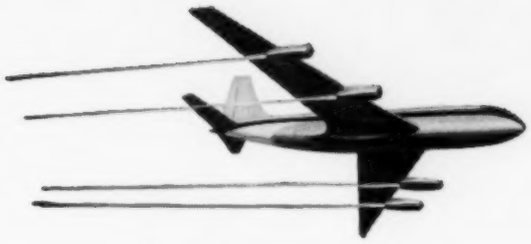
Apache owners are commercial pilots, 41 per cent private pilots. Average Apache pilot has flown 4,091 hrs. and flies his Apache 505 hrs. annually.

HUNTAIR, INC., LINDBERGH FIELD, SAN DIEGO, is new Cessna dealership. Officers are J. Edwin Jones, president; Larry Hunt, vice president; Mrs. Betty Hunt, secretary-treasurer, and Ruth Gamber, assistant secretary.

WINNERS OF 10TH ANNUAL ALL-WOMAN TRANSCONTINENTAL 2,366-MILE AIR RACE from San Mateo County Airport, Calif., to Flint, Mich., were: 1. Mrs. Francis Bera and Mrs. Edna Bower, Cessna 180; 2. Mrs. Alice Roberts and Mrs. Iris Critchell, Beech Bonanza, and 3. Mrs. Marian Craver and Mrs. Betty Lambert, Piper Tri-Pacer.

NEW REFORMULATED GULF SERIES D DETERGENT AVIATION OIL went on sale last month in three viscosity grades for radial as well as opposed engines.

1,000 JET ENGINE OVERHAULS in its first year of jet work for the Air Force were marked last month by Southwest Airmotive in Dallas, which has also overhauled 6,000 AF piston engines and is now turning out 7 Allison J-33 jets daily. Left to right are Col. Clare Bunch, Air Materiel Command deputy chief of maintenance engineering; James Wall, SAC jet overhaul manager, and James Lockhart, Jr., SAC vice president.



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Chance Vought's F8U-1 *Crusader* represents the next generation of Navy fighters. It combines supersonic level flight performance with exceptional combat ceiling, long endurance and ease of maintenance.

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Behind this triumph in aviation achievement lay an intensive research and development program...and experience gained in 38 years of pioneering leadership. Like many other significant Vought advances, it emphasizes a tradition of engineering excellence.

In the field of high performance aircraft, as well as guided missiles, the creative spirit is strong at Vought. Because of this spirit, America can continue to expect superior new weapons from Chance Vought—as long as the need for them exists.

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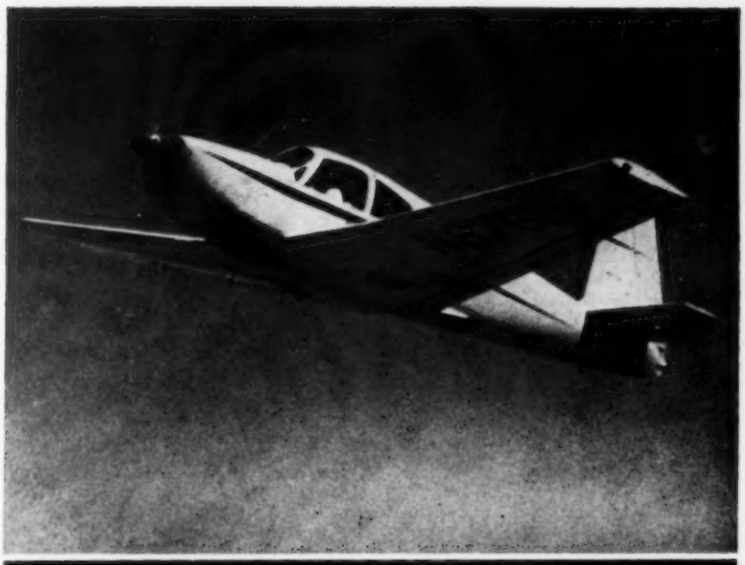

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West Texas Flying Service, Midland, Texas

a letter from Daddy

TO: VICTORIA D'AVI

Dearest Vicki:

You don't know it, but dangling near the windshield of my plane is a tiny shoe you wore as a baby, to remind me I'm the daddy of a gorgeous little girl—and to soothe my eyes after seeing my own big flat dogs beneath the panel. You've grown up but, thank gosh, all your expansion has been in the right places, and your tootsies still are neat and trim. Men prefer ladies with small, shapely feet, especially when displayed by an auburn-haired, brown-eyed Someone who's 18, 5'4½", and 114 lbs.

Southwest Airmotive—my favorite service station—is 25 years old but, unlike you, it has NEVER stopped growing. Now, SAC has:

1. Opened a Mid-West Division in Kansas City, Kans., to distribute and service the products of the Eclipse Pioneer, Red Bank, Pioneer Central, Utica, and Pacific divisions of the Bendix Aviation Corp., and of the AC Spark Plug Division of GM, the Aeroquip Corp., and B. F. Goodrich Co.;
2. Opened a Rocky Mountain Division at Denver, Colo., as distributor for the Bendix Products and Bendix Pacific divisions, AC, Goodrich, and Aeroquip, and
3. Moved ahead with plans for its $2,000,000 service and parts distribution facility at Love Field, Dallas.

Yesmam, faith in the future is identified by Major Investments in the past and present. This always has been the case with Southwest Airmotive. Come to think of it, this also is true in the case of me and my Queen Victoria. I consider the faith of both of us—me and SAC—extremely well placed!

Love,

Daddy

SOUTHWEST AIRMOTIVE CO. • LOVE FIELD • DALLAS, TEXAS

Just among ourselves

EDITORIALS

Cessna Makes Progress While Dreamers Gab

THERE has been no fanfare from Cessna about its new 4-engine, pressurized, business transport, now about to make its long-awaited first flight. But we have watched the Cessna 620 take shape with pride, viewing it as significant proof that once again it is the *business aircraft industry which is developing business flying progress* — and not the military and its sprawling service plants.

Long have we listened while dreamers talked glibly about paper airplanes, promising all sorts of nebulous wonders. None has yet cut a sheet of metal to fit such dreams, however. Several manufacturers have dismissed the challenge of creating new business transports by looking down their noses at the growing vacuum for modern and more efficient multi-engine corporate-type airplanes — sure they would develop something new, but the military or somebody would have to underwrite the project first because no factory could gamble the necessary millions of dollars involved. Lack of faith in the commercial market has made the plants afflicted with this attitude nothing more than a service industry, dependent on the orders and dictates of a single captive customer who pays the fiddler and calls the tunes.

Cessna watched and listened to all this malarkey with the rest of us, tongue in cheek. And while the dreamers were running around trying to find out if a market really existed and displayed their paper airplanes in hush-hush secrecy, Cessna's president, Dwane Wallace, hired Ralph Harmon as project engineer and got the show on the road. With several million dollars invested in the Model 620 we're reminded of all the other postwar business airplanes, specifically the light twins, developed from private enterprise capital. Beech, Aero Commander, De Havilland, Piper and Cessna put their money where their mouths were.

So the first 4-engine pressurized cabin executive transport is well on the way to realization. While the decision to produce and sell it will not be made until complete flight evaluation, we feel confident Mr. Wallace and Company know what they're doing. We're on the threshold of brilliant new horizons for executive air transportation, the phase of aviation development to watch more closely than ever in the years just ahead.

Lest We Forget

THE cascade of commentary spewing forth from aviation experts, self-appointed and otherwise, as a result of recent spectacular air transport crashes, tends to cloud the major problems involved in breaking down the barriers to aviation progress. Fortunately for aviation's future, there's a hard core of realists at work in government, in industry and in associations who are completely competent to gather all the facts and come up with some long-range planning that will guarantee the safe and efficient flow of our expanding air traffic.

The tragic Grand Canyon accident, the worst commercial airline disaster in history, strangely and ironically enough is not the "classic" case of mid-air collision everyone has been fearing. It just didn't happen at the "congested" locations or under the conditions expected. When all the facts are sifted the chances are the present much-maligned archaic system of air traffic control will be way down on the list of contributory causes.

All of our present headaches stem from two causes — unprecedented public patronage of aviation which is straining our air traffic control and ground facilities to the utmost and the failure of government to keep up with aviation progress. While there were many optimistic predictions about the future of commercial airline and business aviation at the end of World War II, nearly everyone connected with the industry sold it short. Worst of all, the CAA, the very agency charged with the responsibility of controlling the airways and building a national system of airports, staffed by dedicated men of technical ability, was booted around and even scoffed at by the budget makers, by the Congress and by groundling bosses in the higher echelons of the Department of Commerce!

If anyone emerges from the present mess smelling like a rose it will be the Civil Aeronautics Administration career men who have been crucified down through the years for having had the unfortunate capacity for looking clearly into the future and who vigorously fought for airways and airport development programs and funds that never came about. Throttled and hog-tied by a bunch of politically-appointed nincompoops, usually topside in the Department of Commerce, who had neither a deep interest in nor a sufficient knowledge of aeronautical matters, CAA staff men and department heads both in Washington and out in the field can provide, if anybody wants it, the record in black and white as to what they sought and what they got.

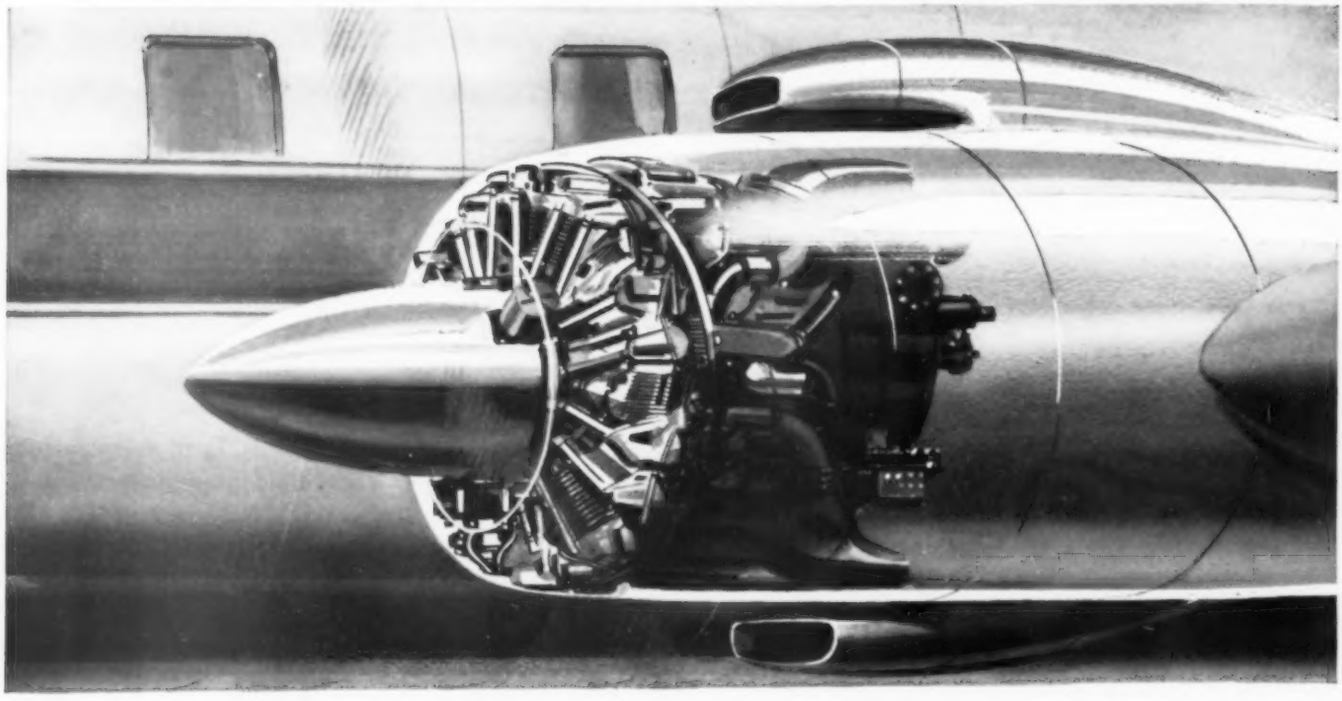
Here's a question that might be expected while hashing over this black chapter in recent aviation history — "Why worry about the failure of past administrations to pay heed to the pleadings of CAA in the years gone by now that something is going to be done about correcting our aviation facilities deficiencies?"

The answer to that question is a simple one. There can be no real long-range progress until the legally-constituted agency is relieved of its basic organizational weakness as an appendage of the Department of Commerce. We can no longer expect CAA to assume the full responsibility for adequate aviation facilities and air traffic control without the necessary appropriations for tools to work with.

Coincident with the hamstringing

(Continued on page 46)

This world famous aircraft engine . . .



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Business is going places today, faster than ever before, in the air—flying inter-city and inter-continent in Douglas DC-7s and Lockheed Super Constellations powered by the Curtiss-Wright Turbo Compound® engine.

The Turbo Compound affects *your* life in countless ways. If you are a business man, you can make an appointment for tomorrow today—though it be a thousand miles away. If you are an industrialist, you can ship critical orders in hours or days instead of weeks, get much needed parts in a hurry, fly to a branch office or plant in hours to solve a problem. And *everybody* can go by air to distant places never before accessible—to Europe or an island paradise on an ordinary two-week vacation, to the bedside of a sick relative, or to reunions they would otherwise have to miss.

The Turbo Compound, most powerful and economical airline engine in commercial operation today, is a big factor in today's low fares. Its high-speed, long-range dependability has been proven by over 23 billion seat miles with a perfect safety record. The virtually unanimous selection of the world's leading airlines, it also powers many of the most important military aircraft of the U. S. and NATO nations. More than 53,000,000 seat miles are now flown daily behind the Turbo Compound. Future schedules call for more than 100,000,000 seat miles per day in Turbo Compound powered equipment.

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THIRD PLACE
Pilot: Marion Craver
Co-pilot: Betty Lambert
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FOURTH PLACE
Pilot: Marian Burke
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Pilot: Irene Leverton
Co-pilot: Carol Cooper
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Plane: Beechcraft Bonanza

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That's a record to be proud of. We think that the Powder Puff Derby has proved, once again, the extra reliability you can expect with AC Aircraft Spark Plugs.

Be sure to specify ACs in your plane.

AC short-reach plug shown: S-88. Others: HSR-86; A-88; S-86 R; SR-83 P; HSR-83 P; LA-47; SA-43; A-44.

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Air Force RB-66 powered by Allison J71 Turbo-Jet Engines

Here you see the Tactical Air Command's newest reconnaissance bomber—the all-weather twin-jet Douglas RB-66.

It carries a payload of nuclear or conventional bombs—which it can wing at 600-700 mph to targets dictated by the nation's needs.

It packs a full complement of camera equipment —which also makes it a valuable reconnaissance tool for air intelligence.

And in pods under its wings it boasts a pair of Allison J71 Turbo-Jet engines — each producing 10,000 pounds' thrust without augmentation — which take it to altitudes over 40,000 feet.

Now winning its wings for reliability and dependability with the 363rd Tactical Reconnaissance Wing at Shaw Air Force Base, S. C., the Allison-powered RB-66 carries a three-man crew as it goes on its peace-maintaining missions.

The Allison-powered Douglas RB-66 is another example of how continuous engine development —both Turbo-Jet and Turbo-Prop—is helping keep America first in the air.

ALLISON DIVISION OF GENERAL MOTORS, Indianapolis, Indiana

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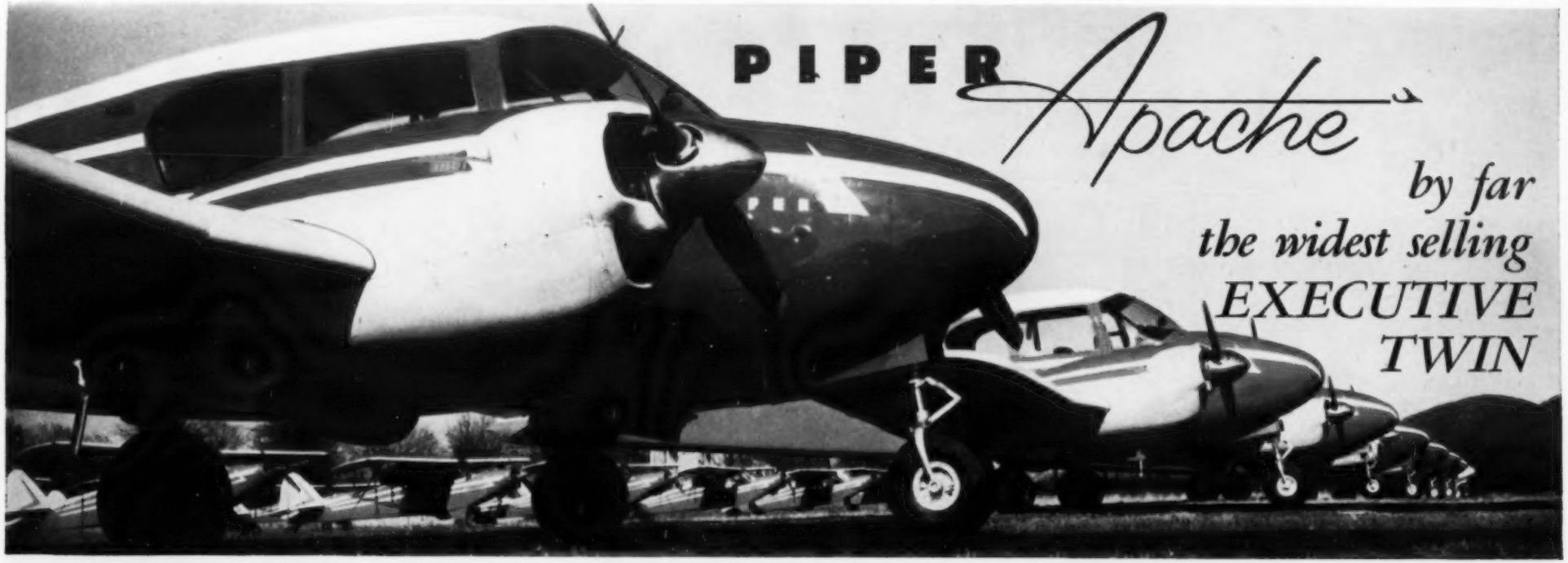

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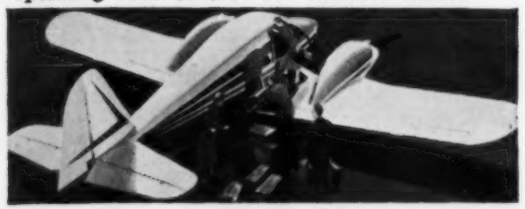
COMFORT Quiet, roomy cabin with picture window view and superbly comfortable seating with either standard or optional reclining seats.

CAPACITY Carry five if you wish for shorter trips. Plenty of room for three on adjustable rear seats plus baggage.

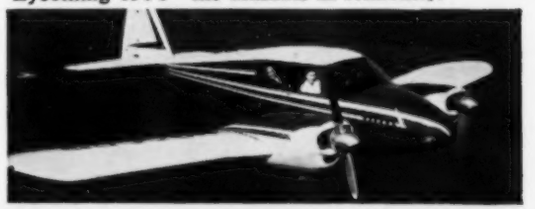
PERFORMANCE 170 mph cruise at 75% power; 52 mph stalling speed lets you use any airport. Excellent single engine performance.

ECONOMY $21,000 less than any other new production twin available. Correspondingly lower operating cost. $34,000 for standard model.



RANGE Up to 1,200 miles (eight hours) at economy cruise with 108-gallon capacity, standard tankage in Super Custom Apache.

RELIABILITY Built to highest standards, proven in millions of miles of use; powered by two Lycoming 150's—the ultimate in reliability.



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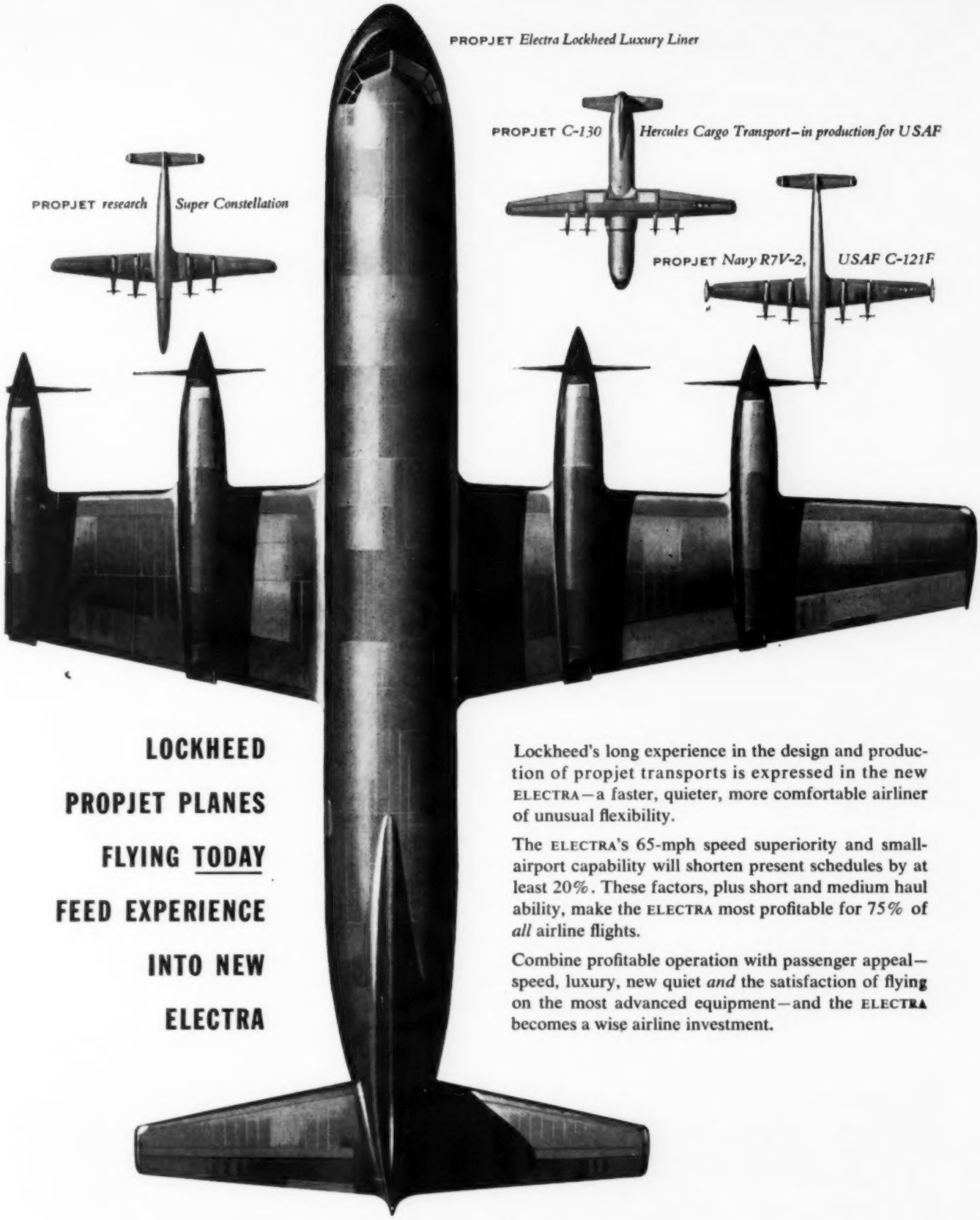
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PROPJET C-130 Hercules Cargo Transport—in production for USAF
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PROPJET Navy R7V-2, USAF C-121F

LOCKHEED PROPJET PLANES FLYING TODAY FEED EXPERIENCE INTO NEW ELECTRA

Lockheed's long experience in the design and production of propjet transports is expressed in the new ELECTRA—a faster, quieter, more comfortable airliner of unusual flexibility.

The ELECTRA's 65-mph speed superiority and small-airport capability will shorten present schedules by at least 20%. These factors, plus short and medium haul ability, make the ELECTRA most profitable for 75% of *all* airline flights.

Combine profitable operation with passenger appeal—speed, luxury, new quiet *and* the satisfaction of flying on the most advanced equipment—and the ELECTRA becomes a wise airline investment.

American, Braniff, Eastern, KLM Royal Dutch Airlines, National and Western Air Lines already have ordered 128 ELECTRAS *for their important routes.*

LOCKHEED

LOCKHEED AIRCRAFT CORP., BURBANK, CALIFORNIA **WORLD'S MOST EXPERIENCED BUILDER OF PROPJET AIRCRAFT**

Long nose of pod-like fuselage and boom empennage feature Temco's Model 51 trainer design, purchased by the Navy and designated as its TT-1. This view shows flight test equipment in rear cockpit. It can take-off over a 50-ft. obstacle in 3,000 ft. and climb at 1,900 fpm. Span is 29.83 ft., length, 30.6 ft., height, 10.82 ft., wing area, 150 sq. ft., normal gross weight 4,400 lbs. and top speed 300 knots at 25,000 ft.
—(Temco Photo.)

Temco TT-1, First Navy Light Jet Trainer

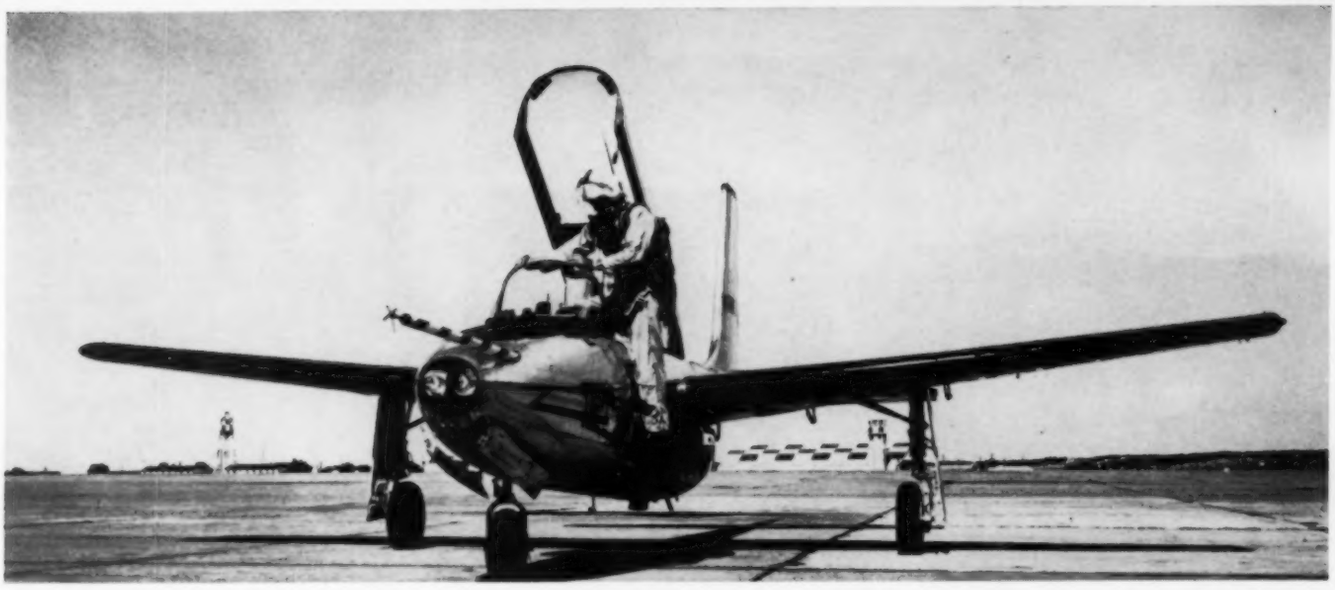
WHEN and how to switch from propeller-driven primary trainers to light jets will now be decided by the Navy, which has selected the little Temco Model 51 for an evaluation of a new syllabus in which student pilots would commence flight training in jet aircraft.

A contract for the production of 14 airplanes was issued recently to Temco Aircraft Corp., Dallas, as the first Navy purchase of a light jet trainer. It is also the first military contract to be received by Temco for an aircraft of its own design.

The Navy purchase, of much greater importance than its value of about two million dollars indicates, culminated a design competition in which the Temco trainer was evaluated and accepted at the Naval Air Test Center, after which the Model 51 was designated as the Navy TT-1 and the first production airplanes assigned to the Naval Air Training Command for its use in setting up the new training program. The present Navy flight training syllabus introduces the fledgling student to jet flying well after he has acquired considerable flight time piloting propeller aircraft. The Navy now feels it is time to find out if propeller training can be done away with and its students started immediately in jet aircraft.

Temco designed, built and flight-tested the TT-1 as a private venture in anticipation of the new Navy syllabus. The little jet features trainer simplicity and handling characteristics. At normal landing weight, with flaps and gear down, it has a stall speed of only 60 knots, which increases to 66 knots at take-off gross weight. Maximum

Sketch shows TT-1's outer panel and leading edge fuel tanks, installation of 920-lb.-thrust Continental jet, ejection seats and liquid oxygen system in nose. Dive flaps beneath rudder are pictured below.
—(Temco Sketch and Photo.)



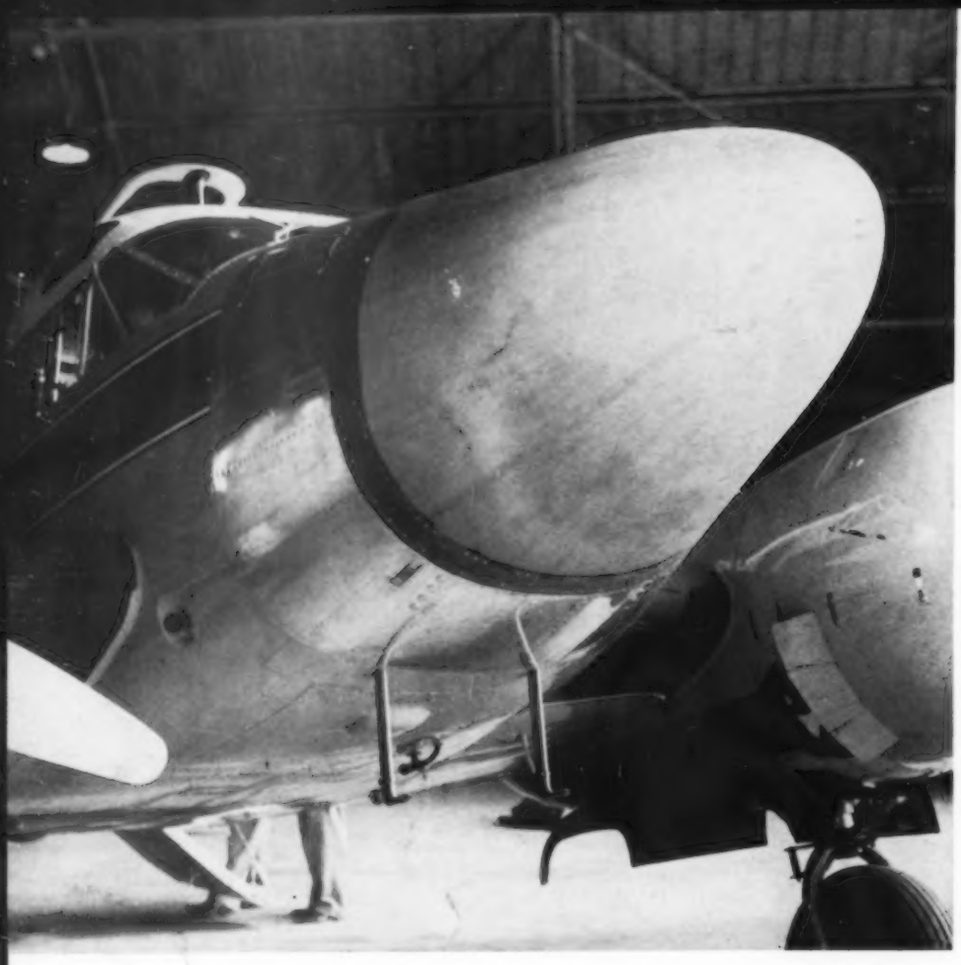
speeds include 285 knots at sea level and 300 knots at 15,000 ft., with cruising speed said to be 215 knots at 25,000 ft.

It is powered by a Continental YJ-69-T-9 jet engine with a static rating of 920 lbs. thrust at sea level and was designed with sufficient "stretch" to take a more powerful jet and larger fuel quantity when desired. Fuel supply totals 165 gals. in eight tanks. Of these, three outer panel tanks in each contain the normal supply of 119 gals., the fourth tank in each wing being a leading-edge bladder which would be used for ferrying without need for auxiliary tanks. With normal fuel, gross weight is 4,400 lbs. and sea level endurance is 1.5 hrs.

Jet simplicity plus trainer handling characteristics and performance "go power" have caused pilots to admire the TT-1's ease of handling. Martin E. Collis, Temco senior group engineer for test and evaluation, recently checked out four pilots in seven hours with the TT-1. In the long, tandem cockpit, the instructor's rear seat is elevated above the front student seat for superior visibility.

(Continued on page 47)

Wide gear, mid-wing and powered canopy are featured in TT-1 photos at top and bottom of this page. Smiles after first flight were recorded in the scenes at right. Bob McCulloch, Temco president, beams while Pilot Martin Collis happily reports. With them are Leon Mason (checked shirt), technical director of systems fabrication, and I. Nevin Palley, vice president — engineering.



Collins Radio's Beech Super 18 nose radome is completely removable by cowl fasteners on new metal section behind it. Radome extends nose farther than that on standard Beech Super 18. Installation was made at Collins' Cedar Rapids airport base.
—(Collins Radio Photo.)

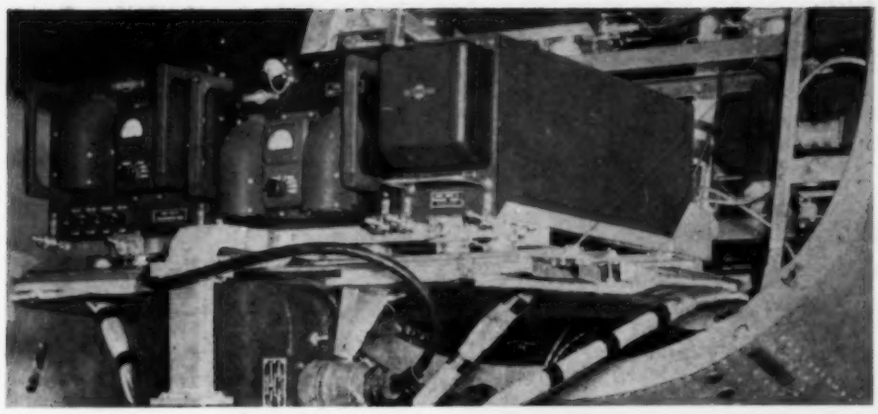
First Collins Radar In New Beech Super 18

FIRST installation of the new Collins WP-101 C-Band airborne weather mapping radar system has been made in the Collins Radio Company's new Beechcraft Super E18 for use as a demonstrator. First commercial installations are scheduled to be made in three executive Convairs, AiResearch Aviation Service at Los Angeles installing the new Collins system in a Continental Oil Houston-based Convair and a United Gas Shreveport-based Convair with Associated Radio at Dallas installing the WP-101 in the Fairways Corporation's Convair, which will also receive the new Collins AP-101 autopilot installation at the same time. In addition, Delta Air Lines will make a fleet installation of the WP-101 radar.

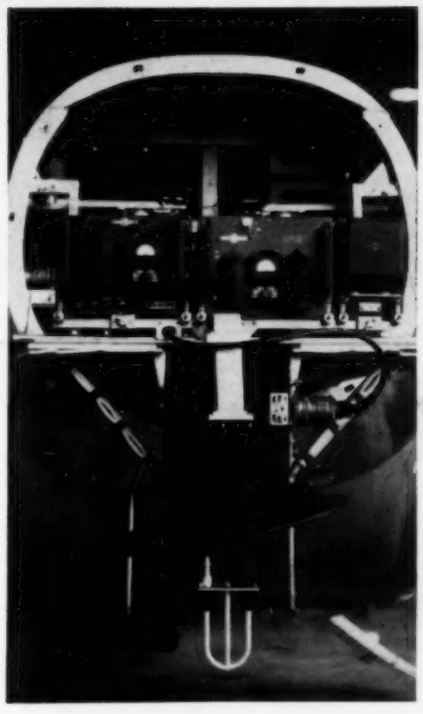
Built to ARINC specifications, the Collins weather-mapping radar has a total system weight of 131.3 lbs. and features the use of printed wiring, modular construction, a load isolator component and magnetic amplifiers. For air transport category aircraft, Collins recommends installation and use of dual cathode-ray indicator tubes, which can be set to simultaneously observe different ranges. The system uses only 40 tubes for a single indicator installation and only ten additional tubes are required for addition of the second indicator. Magnetic amplifiers and mineral diodes in the system eliminate filaments wherever practical and their failure possibilities as well as providing low heat dissipation and lower power requirement.

A special component, called the load isolator, is designed into the Collins system and is located between the magnetron and the duplexer in the receiver-transmitter unit. A one-way power transmission device, it protects the magnetron from damage by returned energy, avoids problems of

Beech panel installation of 5-in. cathode tube, with Collins radar system control unit beneath. Drawings show normal weather presentation (left) and "contour" presentation (right). Latter marks cells by blanking out areas of heaviest precipitation and turbulence.
—(Collins Radio Photo and Drawings.)



Collins 21-in. dish, with glide slope antenna above it, is mounted on bulkhead which hinges down to horizontal position for servicing units on backside of bulkhead, which is covered by energy-absorbent material. Radar system totals 131.3 lbs. in weight.
—(Collins Radio Photos.)



critical line characteristics and expensive line tuning and avoids possible ill effects from high-powered echoes when the unit is operated in a hangar or near structures having good reflective features.

Modular plug-in units are used to simplify trouble-shooting and for instant replacement of spares for continued operation.

The 5400-mc WP-101 system's power source requirements are 115 volts AC, 380-420 cps, 700 volt-amperes maximum and 28-volt DC 1.0 amperes maximum (relay operation). Power output is 75 KWP minimum.

In the Twin Beech installation, performed by Collins at its Cedar Rapids, Iowa, airport base, the airframe nose modification extended back almost to the instrument panel and a new metal section was added there onto which the radome installation was made. A Chamberlain radome is used.

This radome does not hinge but is removed completely from cowl fasteners for access to the antenna system with 21-in. reflector dish. The bulkhead mounting the antenna is hinged at the bottom and swings down to a horizontal position to reveal installation of the WP-101's receiver-transmitter and synchronizer units. These, plus a Collins 51R-3 omni receiver, are installed on the rear of the swinging antenna bulkhead in a vertical position. With the antenna bulkhead swung down for servicing, the units are positioned horizontally. The bulkhead itself is fitted with special McMillan absorbent material to absorb energy in the antenna's rearward sweep. This protects the crystals in the receiver, which could be burned by the energy, and eliminates secondary echoes.

The antenna, which scans a full 360 degrees at 15 rpm., is positioned so that the wave guide is very short in length and is connected directly to the receiver-transmitter.

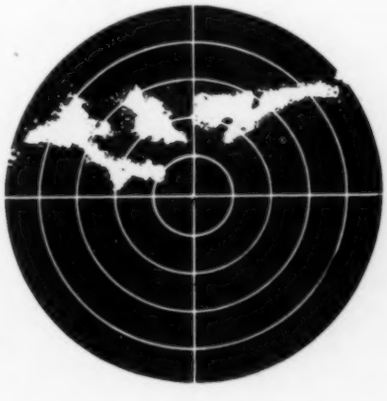
Gyro stabilization of the antenna is controlled from the cockpit. When this is switched off, the antenna is controlled only by its physical connection with the aircraft and the degree of tilt controlled from the cockpit. With the stabilizer switched on, displacement of the antenna from the horizontal is governed only by the tilt control. Thus gyro signals, either from the aircraft's autopilot or from a separate gyro, compensate for changes in aircraft pitch or roll.

The WP-101 cockpit control panel, measuring 5¾ by 3⅜ by 3 ins., is

(Continued on page 47)

Radar picture on 150-mile range shows two weather systems ahead of plane's position at center, heading 12 o'clock. Circles appear every 25 miles.

Switched to 50-mi. range, picture shows 10-mile circle intervals with closer analysis of weather ahead. Front now appears smaller. Radar reveals rapid changes.



Up close on 20-mile range, with circles spaced only 5 miles apart, radar shows pilot that the frontal activity begins about 10 miles out. Collins uses the C-band.

Maximizer kit nose and power section cowl, Siamese exhaust 'stacks, oil cooler fairing and wheel-well doors are shown in these photos of an AiResearch Aviation Service DC-3.
—(AiResearch Photos.)

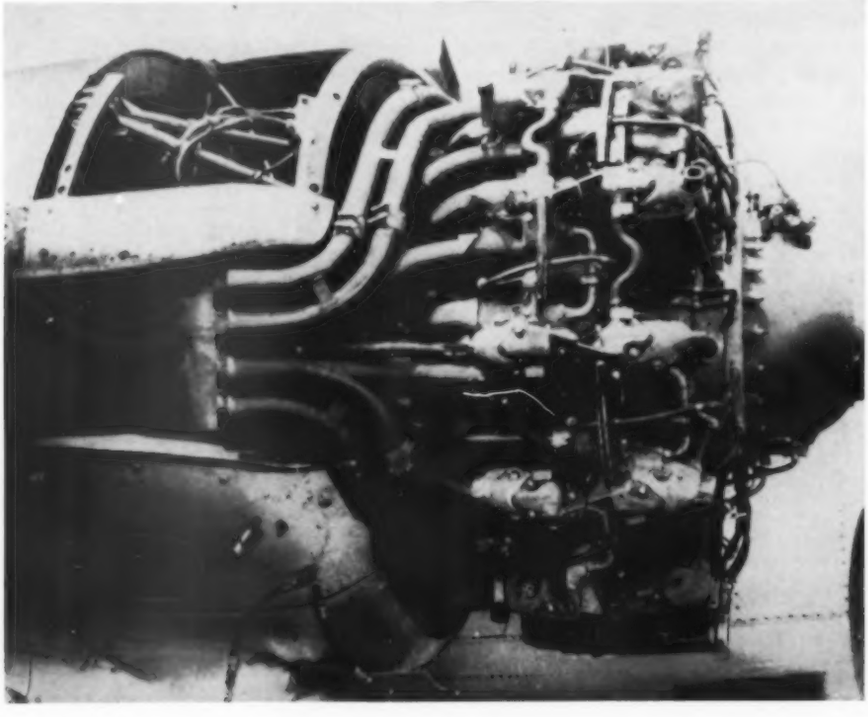
Maximizer Gives DC-3 20 MPH More Speed

THE biggest shot in the arm for the classical Douglas DC-3 yet to emerge from business flying modifications is a new "Maximizer" kit by AiResearch Aviation Service at Los Angeles International Airport. It is guaranteed to give the DC-3 a gain of 20 mph. in cruising speed at no extra power, with improvements in practically all categories of operation, including 200 miles of extra range without additional fuel.

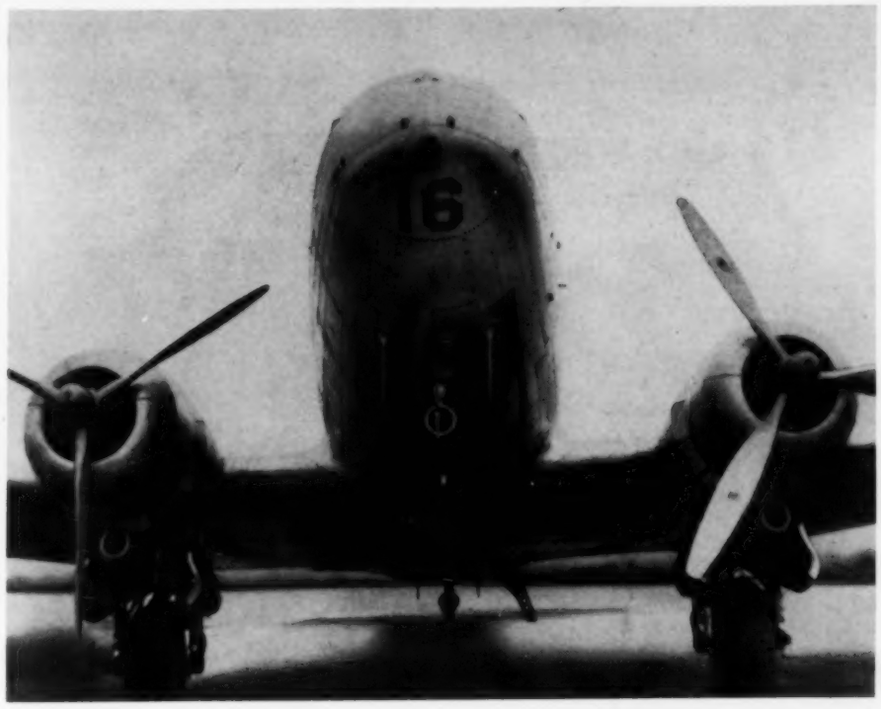
"Performance modernization is effected by installation of a newly-designed, completely integrated system of engine cowling, engine baffles, oil cooler ducting, wheel well doors and exhaust system," says Jack O'Brien, AiResearch Aviation Service manager. "Every aspect of DC-3 performance is modernized, making it what is believed to be the best airplane value in the aviation industry today."

The Maximizer kit can be installed within a short time at a cost of $15,000, he said.

The gain of 20 mph. in speed is guaranteed on the basis of a gross weight of 25,000 lbs. at 10,000-ft. altitude with P & W 1830-92 engines. The speed factor will vary with altitude and with external cleanness, as shown in the accompanying chart. Under these same conditions, at average cruising speed and using 600 hp.



Uncowled engine shows integrated system of baffles and exhaust system with which better performance and reduced drag are achieved. The short stacks are shown below on starboard engine.
—(AiResearch Photos.)



Tail-wheel well closure above is part of Maximizer kit. Front view of Maximized DC-3 shows nosed-in power section cowls, wheel doors and oil cooler inlets.
(AiResearch Photos.)

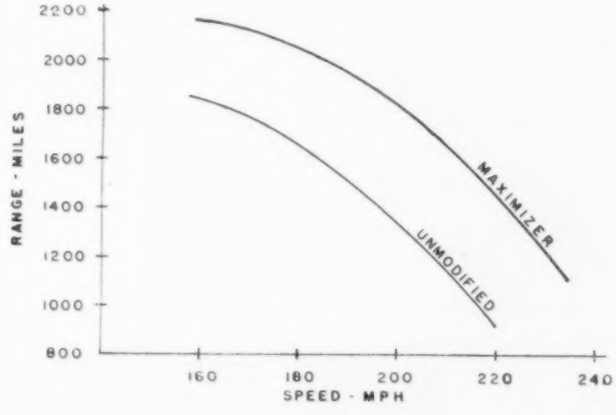
per engine, the Maximizer kit will also give 200 miles extra flight range without extra fuel or larger engines.

At 5,000 ft., using 600 hp. per engine, the Maximized DC-3 will cruise at a true air speed of 197 mph. as compared to 179 mph. for the unmodified DC-3. At 15,000 ft., the true air speed becomes 218 mph. as against 194 mph. for the unmodified airplane.

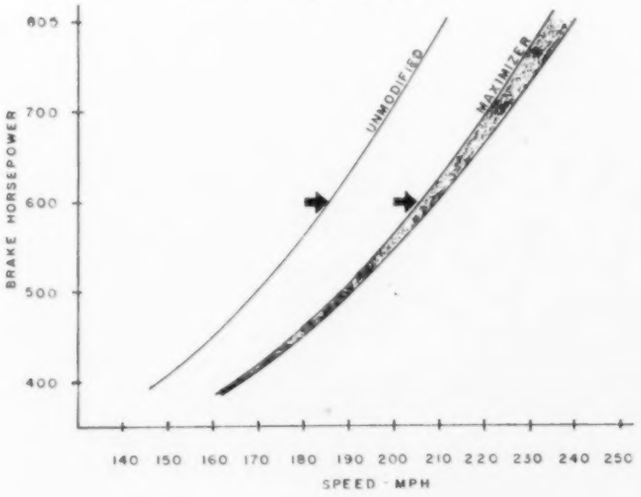
In addition, substantial measurable margins of safety are provided at high and low speeds and rate of climb, with improvements in payload, economy and revenue at no increase in horsepower.

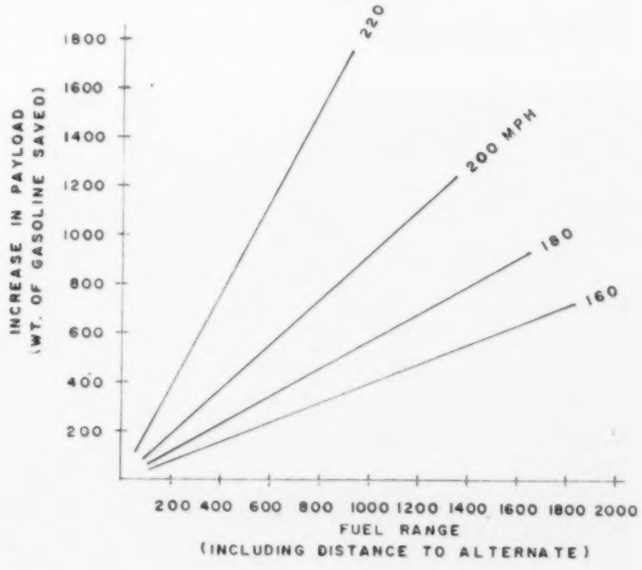
Engine cooling efficiency is increased with a new cowl by improving the pressure distribution of incoming air across the front of the engine. The engine baffle design is an entirely new concept in cooling drag reduction through use of formula-tailored flow-control baffles. New contour of the cowl creates smoother airflow over the nacelles. The new oil cooler fairing makes for less drag and its diffuser entrance design gives greater pressure recovery and improved oil cooling. Main wheel well doors eliminate drag, and a fairing for the tail-wheel further reduces drag.

Benny Howard, well-known racing pilot and aircraft designer, headed a team which produced the kit. ★ ★ ★



These AiResearch Aviation Service curves plot Maximized DC-3 performance gains in speed, range and payload, as compared to standard DC-3. The speed curve's shaded portion shows the additional gain realized by removal of drag-producing appendages to emphasize that a clean airplane will profit still more from Maximizing. All graphs are plotted on the basis of 25,000-lb. gross weight at 10,000-ft. altitude with P & W 1830-92 engines. Engine temperatures are equal to those of an unmodified Dash 92 engine. The graph of range versus speed is based on 800 gals. of fuel used.





Small frontal area of supercharged 6-cylinder Continental engines give pressurized Cessna 620 fuselage appearance of fatness. The Model GSO-526A engine is rated at 320 hp. for take-off and 290 hp. METO up to 15,000 ft. Hartzell propeller diameter is 93 ins. Note wide tread. Main wheel tires are 32 by 8.8 size with 26 by 6.6 on the nose. Gross weight is 13,650 lbs., wing loading 40 lbs. per sq. ft., power loading 10.6 lbs. per hp.

Pressurized Cessna Ready For Flight

By TOM ASHLEY
FLIGHT MAGAZINE PHOTOS

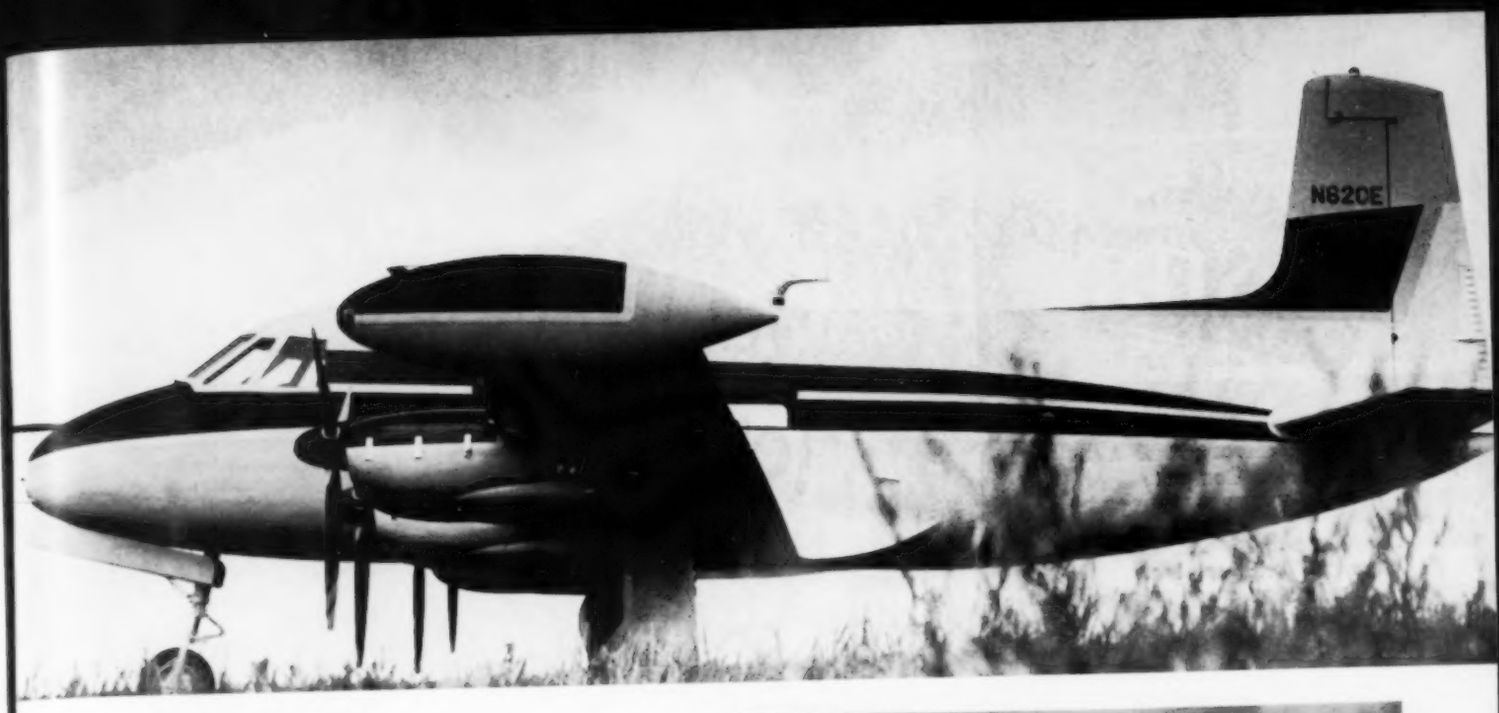
TAXI tests began late in July and first flight was an immediate possibility for the new Cessna Model 620, first 4-engine, pressurized business plane designed and built. "While we won't make any commitments until after flight evaluation, we are happier than ever with the project and it looks more encouraging," Dwane Wallace, Cessna Aircraft Company president, told us.

It was designed, beginning in the first half of 1954, to meet rigid CAR Part .04b airline transport category requirements and its licensing will take about a year more, making it a 1957-58 airplane for practical purposes. Cessna won't mention pricing at this stage and says any estimate, including $300,000 to $400,000 suggested by observers, can be nothing more than guessing.

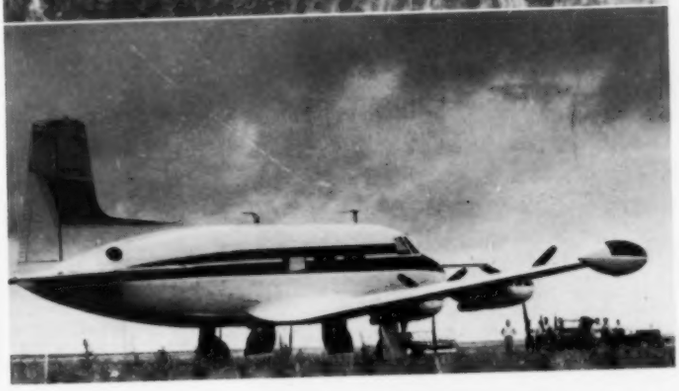
Continental Motors, AiResearch Division of the Garrett Corp., and Collins Radio Company are all wired into the project, making it a completely integrated development. Continental is supplying its new 6-cylinder, 320-hp. supercharged GSO-526A flat engine. AiResearch is supplying its new 105-hp. turbine package, de-rated down to 55 hp., for cabin pressurization with a 3.54-lbs.-per-sq.-in. differential (8,000-ft. cabin altitude at an airplane altitude of 18,000 ft.), draft-free refrigeration cooling and heating. Collins is supplying a custom installation of new communications and navigation equipment, with a possibility that new lightweight autopilot and weather radar will be in-

(Continued on page 50)

Exhaust for auxiliary turbine power unit in tail compartment is seen as black circle above stabilizer. Turbine fuel line is in exterior skin behind wing-fuselage fairing, completely removed from cabin. Boom extending from nose is for flight-test operations. Windows are large, measuring 16 by 30 ins. Turbine is started on ship's battery and drives generator powering ground blowers for air conditioning or heat. Engine starting is on turbine generator through ship's battery.



Interesting views of the Cessna 620. Small tip tank holds 65 gals. Total fuel capacity is 535 gals. Span is 55 ft., length 41.55 ft., height 16.4 ft. Design performance promises include 235-mph.-cruising speed, fuel consumption of 75 gals. per hr., and a 22,500-ft. 3-engine ceiling.



Project Engineer Ralph Harmon smiles proudly (above). At right, he shows downward opening cabin door, fitted in wing-fuselage fairing. In view below, note clean wing, large, bird-proof windshield.

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Dal-Tex Aviation, Inc.
Highland Park Airport and Love Field
Dallas, Texas

Dixie Air Associates, Inc.
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Executive Aircraft Company
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Hair Flying Service
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Howard Aero, Inc.
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AUTOMOBILE DEALER: Jim Cashman, a General Motors dealer in Las Vegas says, "I couldn't get along without my Cessna 310. It makes possible a lot of business travel which I couldn't undertake any other way. I call it my magic carpet because that's what it really is to me and my business."

OILMAN: John Myers, former Lockheed engineering test pilot, says, "I wanted a comparison so I flew the Cessna 310 and others before I made up my mind. The 310 is extremely efficient, easy to handle. Its good power loading gives excellent acceleration, gets me into and out of short fields, easily."

CONTRACTOR: Rupert Chisholm's business interests are spread from Southern California to Alaska. Mr. Chisholm covers this territory in his own Cessna 310. "The more I fly it, the more I like it," says Chisholm. "The 310 is faster. Handles easy, too. I looked over a lot of airplanes before I bought my Cessna 310."

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5 GREAT CESSNAS 170 172 180 182 310 THE COMPLETE AIR FLEET FOR EVERY BUSINESS NEED

This night scene shows a corner of the busy L. B. Smith Aircraft ramp on Miami's International Airport, with Lockheed, Curtiss and Douglas transports being serviced. The firm has turned out some 250 multi-engine transport conversions.

Miami Maintenance Center

AIR travelers have known Miami's International Airport for years as the aerial gateway to the Caribbean and South America. Now a growing number of business aircraft users, especially those who travel in corporate-owned multi-engine executive transports, know International Airport as one of the country's leading maintenance centers for large business planes.

While fabulous Miami Beach and distant off-shore resort areas are the chief magnets for Miami's tremendous drawing power, the L. B. Smith Aircraft Corporation's large shops and facilities can claim some of the credit for helping to make International Airport a busy aerial cross-roads of the Western Hemisphere. Spend a day or so around the L. B. Smith pilots lounge and you'll see multi-engine business planes pull onto the ramp with the names of prominent firms from virtually everywhere. L. B. Smith not only has the facilities it takes to satisfy the customer's needs but Miami's matchless resorts make it possible for aircraft owners and crews to combine their maintenance or conversion downtime with a wonderful vacation.

These assets have enabled LBS to quadruple its sales, service, conversions, special installations, parts and maintenance revenues in the last two years. Herrol Bellomy, executive vice president, said the firm now employs over 1,000 workers in its four enterprises on International Airport.

"We have converted more than 250 multi-engine business transports," Bellomy says. These have included Lockheed Lodestars, Douglas DC-3's, Douglas A-20's, Lockheed PV-1's and the various Grumman amphibians. One of the newest of all executive transports, a Vickers Viscount turbo-prop, is scheduled to receive some of its interior installations from LBS.

Corporations which have purchased these planes are headquartered in all

Scenes at L. B. Smith below include pilots lounge, electronics shop, metal shop and the woodworking department of the upholstering shop. LBS employs a staff of more than 1,000 workers.

The de Havilland Beaver in Saudi Arabia

Indefatigable Beavers of the ARABIAN AMERICAN OIL COMPANY operate from blistering desert sand in temperatures as high as 120°F. Under conditions as gruelling as those found anywhere in the world, ARABIAN AMERICAN Beavers have established an enviable record of unfailing serviceability.

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L. B. Smith has licensed the Curtiss C-46 (above) for scheduled airline passenger carrying. Its Douglas DC-3 conversions (below) feature large windows and cabin spaciousness. This Douglas is the firm's "Tropicana" version, which has no bulkhead separation between cockpit and cabin, giving passengers a view ahead.

sections of the United States and Colombia, the Dominican Republic and Canada. Recent customers observed on the LBS ramp include the Minnesota Mining DC-3, in for 8,000-hr. work and an interior; the Arthur Godfrey DC-3, in for a complete rework; and a Food Fair Super 680 Aero Commander, just delivered by LBS, which is a distributor for Aero Commanders.

The L. B. Smith maintenance and conversion center utilizes work area totalling more than 175,000 sq. ft. in two large hangars and adjacent work shops. Complete turn-key conversions of large multi-engine aircraft emphasize creative modern interior designs, for which a large staff of experts are equipped with extensive resources. The "light, spacious look" in aircraft cabins characterizes their work and is achieved with large windows, light-tone fabrics and upholstering materials and the extensive use of glass in compartment bulkheads.

Several engineering feats for transport and executive aircraft have won L. B. Smith acclaim, the latest being certification of modified Curtiss C-46's. The firm has long been identified with C-46 work and sales and joined with Air Carrier Engineering Services in the long, costly project of passenger licensing for scheduled carriers. This new version, designated C-46/CW-20T, powered by 2,100-hp. P & W C-series engines, at 47,500-lb. gross, will carry 45-55 passengers.

In keeping pace with business flying expansion everywhere, L. B. Smith has long since used up all available space at its present location. The solution to its problem will be new and much larger facilities. Plans have been prepared and negotiations are under way for a new base costing $2,000,000 or more. —T. A.

One of the airframe "tunnels" at L. B. Smith, in which complete rebuilding is performed, is shown below.

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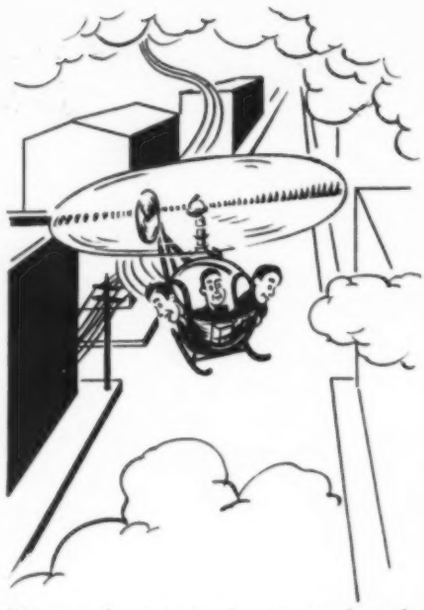
Low And Slow

By DICK DOYLE

WHEN the company for which we fly, the Fastener Corporation of Franklin Park, Illinois, recently purchased a helicopter for business use, it was our happy assignment to ferry the new aircraft home from the Hiller factory at Palo Alto, California. There were ups and downs aplenty to make it a memorable experience — a helicopter is superior to any vehicle because it can hover, back up, fly sideways and land or take-off from a spot no larger than its own dimensions. It took us 6 days, 17 fuel stops, 560 gals. of gas and some 35 hrs. of flight time to cover 2,220 miles — and we got a lot out of the experience, which more and more fixed-wing pilots will become familiar with as company copters become more numerous around the country.

Our first leg of the journey convinced us of the helicopter's versatility. It was to Fresno for fuel, 2 hrs. 30 mins. from a dawn take-off at Palo Alto. Don Armstrong, a Hiller factory pilot, was with us and morning ground fog, which dotted the countryside below while we cruised at 2,000 ft., was scheduled to lift and burn off before we got to Fresno. Only it didn't. We let down to 500 ft. about 20 miles out of Fresno, dropped down to 200 ft. a little later and wound up only 50 ft. above the ground to stay under the stuff.

This is no trick at all in a copter because you just slow down to a good walking speed, detouring obstacles right and left. Navigating, however, is not the easiest at that altitude, especially since our new copter, the very latest 3-place, 2,500-lb., 200-hp., Hiller Model "C" was equipped only with communications radio. All we could do was call nearby Chandler Field Tower and describe our surroundings for a clue. This, too, worked in a way until we ran low on fuel. It was no sweat, however, and we simply selected the first available parking lot adjacent to a service station. A motorist pointed the way to the airport and we flew down one street so many blocks and across another one to the airport boundary, where Runway 11 guided us to the ramp and a gentle landing right next to the fuel pump so we could take on the required 100 octane.



We were down to 50 ft., to stay beneath. But it was no sweat — we just slowed down to walking speed, detouring obstacles right and left.
—(FLIGHT MAGAZINE Drawing by J. S. James.)

After breakfast, the ceiling lifted and even lightplanes began flying while we resumed our trip in pretty "Miss Duo-Fast," chopping along nicely with sufficient altitude for check-point navigation to Bakersfield for another fueling and on through Tehachapi Pass to skirt Edwards Air Force Base at Muroc in the Mojave for mid-day refueling at Barstow. Sitting down at the pump there, we found nobody around but a neatly-framed note advised us how to serve ourselves while the attendant was gone on an errand, explaining how to figure the cost, leave the money — and enjoy a coke on the house, which was wide open, when we finished. Here was an operator we liked, admiring his faith in transients. But we didn't have the time to wait and thank him in person, for we had to meet an airliner at Las Vegas, where Don would return to Palo Alto and we would pick up Bob Boughton of Hiller Helicopter Sales, who had come out from Chicago to make the rest of the trip with us.

An early take-off next morning gave us an opportunity to look down on Boulder Dam as we headed for Prescott, our next fuel stop. But we had to cut short our sightseeing to get the most out of our fuel and make Prescott, 200 miles across desolate country with filling stations far between. In the first 100 miles, we saw only one human being — driving a car down a dusty road. Highway 66 crossed our course for a check-point and we soon put behind us a spot on the map which was our point of no return. We began transferring fuel from the auxiliary tank when our main tank showed a little less than one-fourth and entered some canyon country which offered no check-points. There were mountain peaks in the distance but they were difficult to identify.

It was work to hold a course until a contour came up which was identifiable — Cotton Wood Cliffs. A check showed our fuel down to a 60-minute supply so we backed off a little on the power, throttling back to 2,900 rpm. and 18 ins. of manifold pressure for a try at stretching the gallonage. This, plus turbulence, cost us a little altitude so Bob began mountain-flying Miss Duo-Fast, nudging the copter right up to the cliffs, beside which upward air currents going our way lifted us 900 ft. or so and over the rim.

Thus helped up to 5,000 ft., we could now see Old Granite Sides Mountain 65 miles in the distance and some 10 miles from our destination at Prescott — and some 2,000 ft. above our altitude. Unable to top it, we altered our course and began looking for possible landing spaces, finding none

Here's our pride and joy, the Fastener Corporation's new Hiller.

among miles of rocks which outcropped at grotesque angles. What looked like a little desert was seen off to the left about 10 miles, but Bob held his course into the rocks which rose up before us, searching for rising air currents. Soon he found the updrafts and we sailed on them past Old Granite Sides with the fuel gauge bouncing solidly against the empty peg. We still had 8 miles to go and began watching for a drop in fuel pressure. But it was all downhill and we made it to the field, where both tanks took their full capacity, 46 gals. total. Miss Duo-Fast had made the last few miles on fumes alone. One more circle back at Boulder Dam would have been too many.

While enjoying lunch, our discussion of the Las Vegas-Prescott leg prompted the purchase of a couple of little 75-cent survival kits containing, in a box about the size of a cigaret pack, a compass, whistle, fire starters, boullion cubes, waterproof matches, chalk, water purifiers, 10 ft. of nylon line, fish hooks (but no bait) and aluminum for cups or other utensils. We also put a little extra effort into the normal preflight inspection of Miss Duo-Fast, especially in greasing all the points. A helicopter has more movable parts than a pinball machine and by daily greasing, you not only lubricate but purge out dirt and grit. Some of the rod-end bearings have a tendency to tighten every few hours, so we grease them at each fuel stop.

Heavy turbulence slammed us around — it felt as if Miss Duo-Fast was being spanked by a huge plank, her nose pitching and yawing. But we were buffeted upward.
—(FLIGHT MAGAZINE Drawing by J. S. James.)

We were off the ground at Prescott before noon and I soon had opportunity to become familiar with turbulence in a helicopter. Because of its relatively slow speed and the built-in shock absorber action of the main rotor, a helicopter reacts to rough air a little differently than a fixed-wing aircraft. Rising and descending columns of air cause "bumps" similar to riding over "washboard" roads in a car — you shake at a fast pace but take it slowly, as in a copter, and you bounce. Crossing a river, we gained a thousand feet in an instant and were

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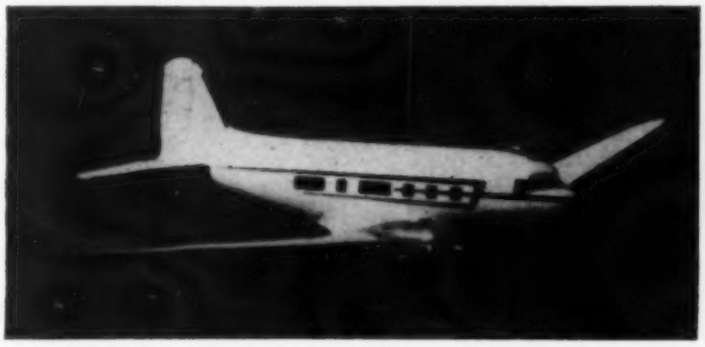

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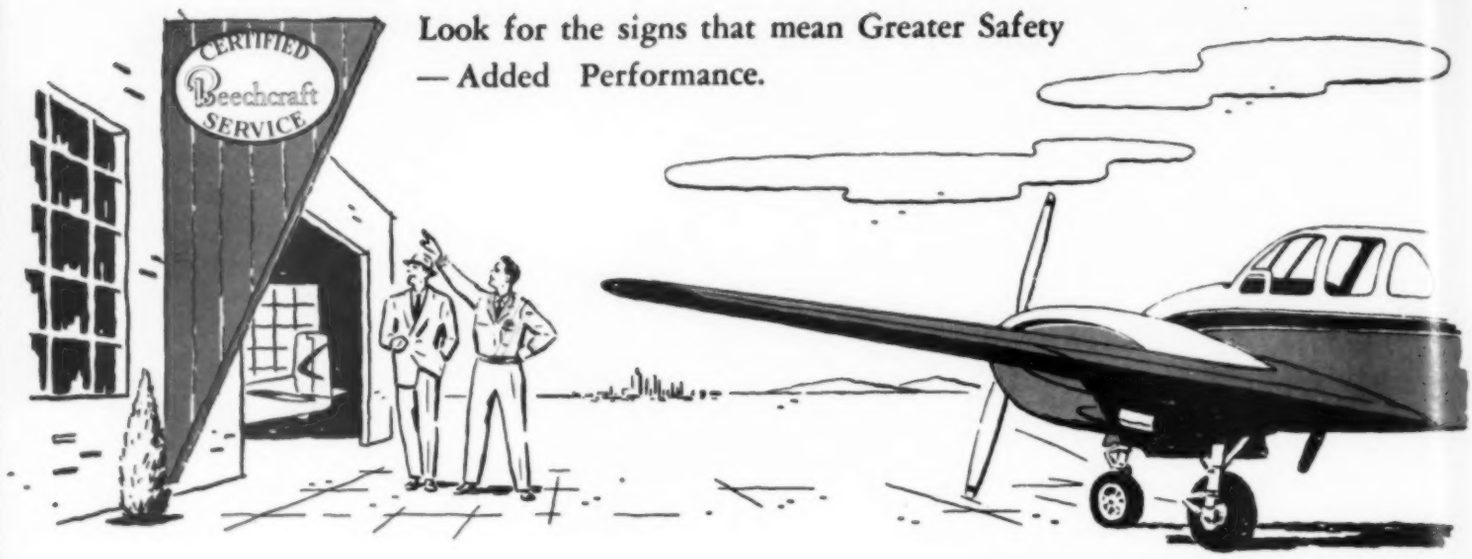

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up to 8,500 ft. within a couple of minutes as we approached a 7,700-ft. range. It was beginning to feel as if Miss Duo-Fast was being walloped on her bottom by a large plank, her nose pitching and yawing. The rotor speed was all over the tachometer and our air speed jumped back and forth between 35 and 80 mph. At times we had the power completely off, the rotor in full low autorotation pitch but still were being buffeted upward. Finally, we figured more experienced hands were needed and asked Bob to take over. Freed of the controls, we got to looking over the bronc we were riding and for the first time doubted all the whirling machinery on the rotor mast. Everything up there was in harmony, of course, turning 320 rpm., but farther from the rotor center, everything was blurred, gyrating wildly but holding together. The transmission, just above the power plant, a foot or two from the backs of our heads, was whining away for all it was worth as the turbulence loaded it and then released it.

Our thoughts flashed back to the people we had met at the factory and the thousands of parts they put together in assembling Miss Duo-Fast. Had any weak parts escaped detection? For a fixed-wing pilot, it was a

East of Amarillo, the flat prairies were so nice we sat down on a little sand dune to relax, sun and shoot some pictures. We had it made.
—(FLIGHT MAGAZINE Drawing by J. S. James.)

new experience in all that turbulence — with no visible means of support. But Miss Duo-Fast kept right on grinding and taking it and our doubts grew into admiration of the helicopter as a practical vehicle, backed by many thousands of hours of reliable, efficient operation in war and peace. Within a few minutes we were out of the turbulence, across the range and Bob had us back down to 7,000 ft. and flying became more normal. On past Mormon Lake and a big meteor crater, 600 ft. deep and a mile in diameter, we chopped through now smooth, now turbulent air, refueling at Winslow and taking off immediately for Gallup, New Mexico.

In Pueblo Valley we chopped through a dust storm of the kind we had only heard about. We were at 6,500 ft. and in it but were bucking along now with a healthy tail-wind, following Route 66 into Gallup. There we learned just how strong our helpful wind was, for when we turned into it, our ground speed dropped down to a mere 10 to 15 mph. while we were indicating 70 mph. We wallowed down next to the fuel pumps with Bob jumping out to slow down the windmilling rotor so it wouldn't strike the tail boom in a gust. A wind check after gassing up and having lunch showed 35 to 55 mph. A take-off at our weight and at Gallup's elevation of 6,788 ft. is impossible in Miss Duo-Fast's manual, but the book didn't know we had a wind of near cruising speed to lift into so we ran the engine up slightly over maximum,

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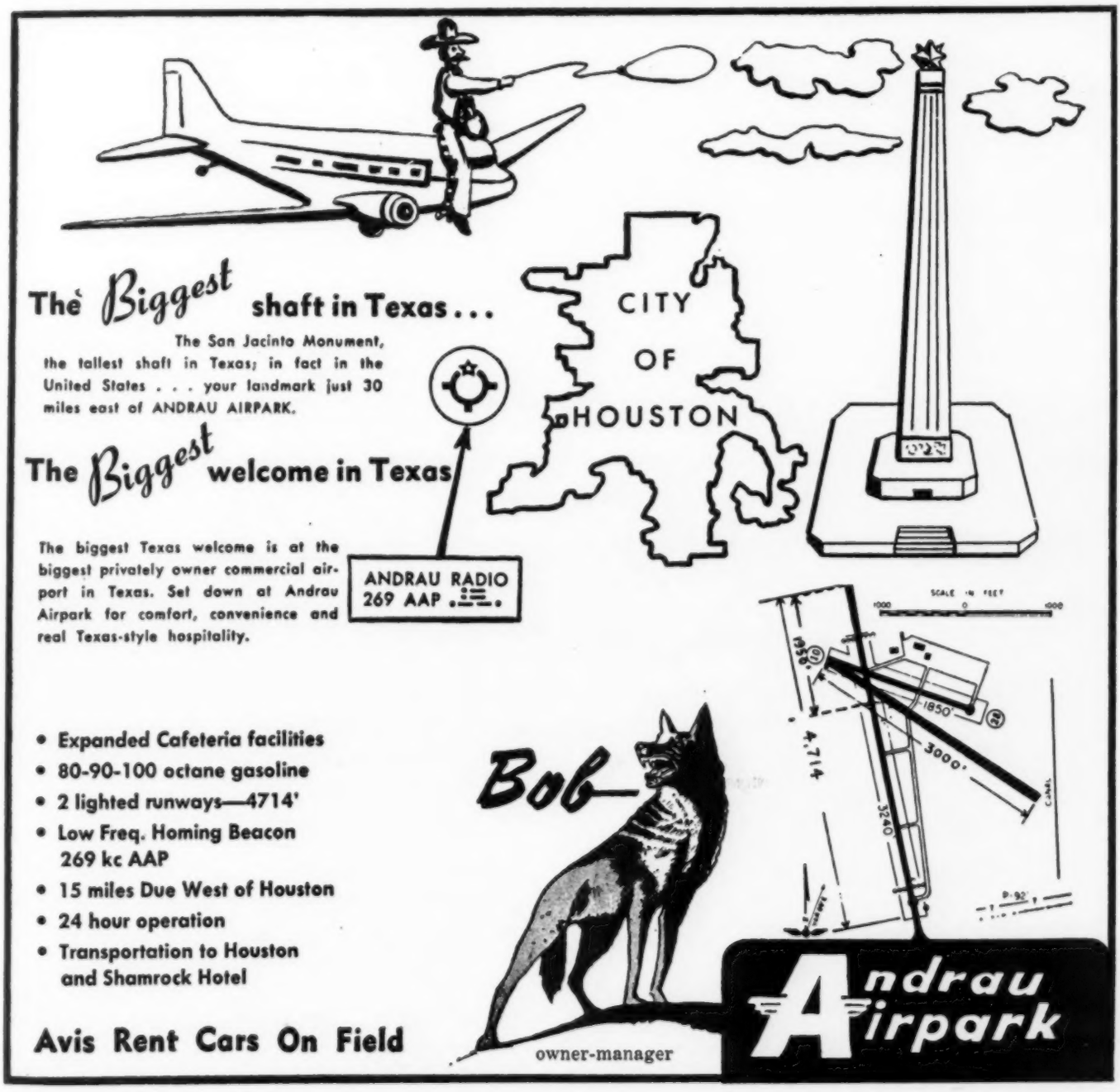
got the skid off a foot or two and eased her into forward flight. It wouldn't hold that foot or two, though, and Bob took over and climbed, ever so slightly.

He would coo to Miss Duo-Fast one moment and in the next cuss her as if she were the devil. After 15 minutes of this we had climbed to 400 ft. for the third time — each time we figured we had it made a downdraft would ease us back down to 50 ft. But we managed to sidle over to a slope, found a riser and rode the air flow on up to 8,000 ft., or about 1,200 ft. above the terrain, and were knocking off about 130 mph. ground speed after we turned with the wind to hightail it across the airport for Albuquerque, making the hop in only 1 hr. 40 mins.

Next morning found us at the airport before 7 o'clock in blowing sand and dust but by 1:30 p. m. we were able to get away for a try at the pass between two hills, 10,680 and 7,980 ft. It looked impossible in the turbulent head-winds we now had but we climbed to 7,000 ft. and headed for two ridges on the northern slope, making 40 mph. ground speed. We had cleared the first ridge by 100 ft. or so when the second loomed up suddenly, with Bob diving for it, catching a sheet of rising air to be lifted up and over with room to spare. Mountain flying was an eye-opener to us, for had Bob's choice been ours, we would have made a 90-deg. turn to the right for the middle of the pass, and this, he later advised, would have put us squarely into stronger down-drafts.

We were through the gap but a check showed we were only making good about 47 mph. and would never reach our fueling stop at Tucumcari; so 2 hrs. 40 mins. from take-off and 20 miles shy of Tucumcari we spotted a likely-looking service station and landed in the rear for 10 gals. Auto fuel runs a little rough and is definitely not recommended but we had no alternative and got into Tucumcari okay, refueling on 100-octane and getting off for Amarillo, which we hoped to reach shortly after dark.

This was in the winter, and we were now in cold air, the outside air temperature being below freezing with no heater in Miss Duo-Fast. Our feet were numb and every draft was becoming a gale, when, 80 miles out, the copter suddenly began to vibrate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alarmingly. We shot a glance over our shoulder and noticed the vibration damper was oscillating more violently than usual, turning to inform Bob. He looked and observed one of the dampers was missing, having parted company with us in the instant I had turned from it. This had never happened to a new machine as far as Bob knew, but was nothing serious. By now the sun had gone down and darkness was upon us, so we let Miss Duo-Fast vibrate and concentrated on navigating, looking for TV towers and eventually landing at Tradewinds Airport in Amarillo. There we ran an inspection and vainly searched with a flashlight for the missing damper, arranging for an oil change and calling Helicopter Air Service in Chicago for them to cannibalize Phillip Armour's N-5304V for a vibration damper to be air expressed to us during the night.

Next morning at the field, Lloyd Hefner, Tradewinds' chief mechanic, surprised us by walking out with a brand-new hangar-made damper he

(Continued on page 52)

JUST AMONG OURSELVES

(Continued from page 19)

of the CAA by administrations that come and go and by the budget people, CAA has been constantly clobbered or had its problems ignored by the military establishment and by commercial aviation groups. The Congress can do something about the Department of Commerce cross and the military burdens the CAA has borne in recent years but the U. S. aviation industry must change on its own accord or continue to cut its own throat every time it pulls the rug out from under the one agency that stands between complete military domination of the airways and the other extreme of paying the bill out of their own pockets through high user charges for airports and air traffic control facilities. It is fantastic that in all the expert planning and researching now under way by a thousand and one elements in and out of government so little thought is being given to this terribly basic factor in aviation — who is going to administer the modernized facilities and who's going to foot the bill? The assumption is that the Congress, after beating the drums loudly enough, will come across with the money required. We have just seen the strange spectacle of the Air Force getting nearly a billion dollars more than the administration requested. Money is power and the possibility of military domination of the systems to come is not to be shrugged off lightly.

In the long and painful interim ahead between now and the time we can start modernizing our aviation facilities, perhaps from three to five years, we must struggle along with what we have. There is no cure-all magic system of air traffic control and landing and field facilities that will be thrown open for use at high noon on June 23, 1958, or any other date. Decisions and programming will come gradually. Because of this peculiar aspect of the problem we can no longer continue to circumvent or torpedo the Civil Aeronautics Administration. All the day dreaming of magical electronic gadgets to come and wishful thinking for automatic push-button flying in all kinds of weather, even if realized, will not make up for all the years eaten up by the locusts.

We know where the CAA was during those years. They were hard at it trying desperately to make the plans and get the money in order to prepare for the booming business and traffic we have today. And they're still there doing a mighty fine job with the limited tools and equipment and people their meagre appropriations have provided.

If the aviation industry is wise enough to profit by its past mistakes it will think twice before it stands by and permits the CAA to be circumvented, hamstrung and belittled any longer by powerful, selfish groups while the prophets of doom and rabble rousers cloud the issue during the days to come. Sincere men are trying diligently to solve the enormous aviation facilities problem. As the work progresses in the modernization and expansion of our airways and ground facilities to handle even greater public patronage of the airplane, we feel confident the legally constituted aviation authority will emerge as the focal point and caretaker of better, safer and more efficient systems and facilities both in the air and on the ground.

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TEMCO TT-1 JET

(Continued from page 27)

Latest developments in the Temco project are flight evaluations by two Air Force teams, one from the Air Force Flight Test Center at Edwards Air Force Base, California, and the other from the Air Force Training Command headquarters at Waco, Texas.

Tooling for production of the Navy order for 14 TT-1's is under way and will be expedited to deliver the airplanes beginning in July, 1957. Larger orders for the light jet trainer are expected by Temco. ★ ★ ★

COLLINS RADAR

(Continued from page 29)

mounted below the cathode ray indicator unit in the center of the Beech instrument panel. The indicator unit mounting measures 6¼ by 6¼ ins. and its depth is 12½ ins.

Both of these units have several controls. The control unit has an on-off-standby switch; an antenna tilt selector offering 10 degrees up to 15 degrees down; a low-to-high gain control; a toggle switch for normal or contour viewing and a toggle switch for on-off stabilization. The indicator unit, which contains a 5-in. cathode ray tube, has a range selector for 20, 50 and 150-mile ranges; a video control; an intensity control for screen brilliance; and a dim control for panel lighting.

When an object or cloud formation is observed on the screen, its bearing relative to aircraft heading is measured in degrees around the indicator face. Range of the weather formation or object is determined by noting the distance of the picture from the center of the screen or the nearest range circle. On a 20-mi. range, circles on the screen are 5 miles apart; on 50-mile range, they are 10 miles apart; on 150-mile range, they are 25 miles apart. The aircraft's position is at the center of the screen.

By locating weather formations on the screen and their bearing from the aircraft, headings may be altered either to avoid the clouds or to penetrate them in areas of least turbulence. Turbulence is analyzed by switching the control to "contour," by which stronger echo signals trigger a "release" to blank out density areas in the cloud, caused by heavy rainfall and rapid changes in precipitation. With usage, pilots acquire a technique for interpreting contour indications by which smooth flight is possible at all times. With pilot and co-pilot using two indicators, each presenting a different range, navigation through extensive weather systems is facilitated.

While the WP-101 is primarily for weather mapping, it also provides for terrain mapping because cities, towns, shore lines, mountains and, to a degree, lakes and other bodies of water show up on the screen by their echoes. Airborne radars of the weather type are not reliable for detecting other aircraft.

First installations of the WP-101 are being made with a pre-production quantity of the systems, produced in Dallas plants of the company where production lines are now gaining momentum. Each WP-101 system is given a 15-hour factory run-in before delivery.

It is understood that Collins is now developing an ultra lightweight and miniaturized airborne weather mapping radar system for business aircraft smaller than the Beech Super 18. These would include Aero Commander, Beech Twin-Bonanza, Cessna 310, Piper Apache, Temco Riley Twin and Camair 480. It would have a total weight of less than sixty pounds. No details are available but it is believed the miniature version will use a 21-in. dish but will be able to fit it into an airframe nose diameter only slightly greater than that of the dish. ★★★

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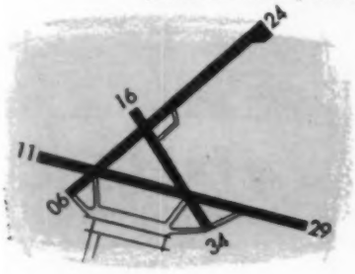

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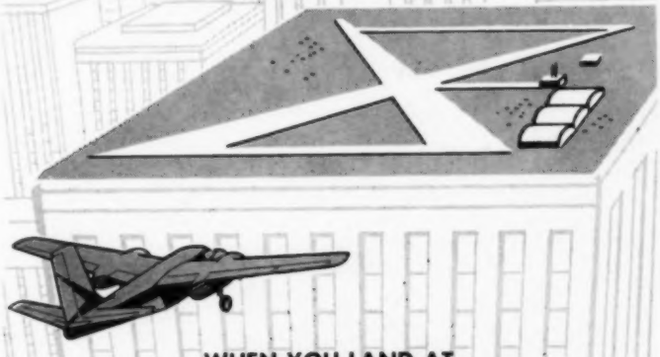

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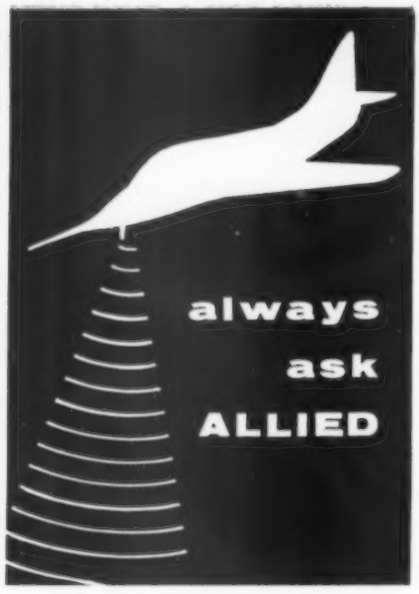

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Questions and Answers for Airport Operators

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QUESTION: I've been noticing that recently your column has had a few words to say in favor of better provision for general aviation with particular emphasis on general conditions which prevail at airports serving our metropolitan areas. I am an operator and in my own city I have no problem as to facilities to serve corporate and executive aircraft. However, due to the fact that we do serve a very favorable percentage of transient pilots and owners and operate extensively in the air taxi and rental business we can not remain ignorant of the conditions which are making business flying a trying experience and a truly expensive one in many of the metropolitan areas.

Our town is not above the medium population class. It has good airline service, well-cared for as to facilities. Our company has two hangars, an old one and a new one which boasts office, parts and lounge space and air conditioning in the office and lounge. I never thought I'd see the day!

We took mid-year inventory the other day and my youngest son didn't stop with the parts department and the shop. He dug into my office and into a little cubby-hole room over in the old hangar which I had sorta kept sacred to the old days by a lot of keepsakes and old periodicals and letters and junk that a man collects as he goes along. Up over the cubby-hole and under the eaves he found a box which contained a copy of "Popular Aviation" for July, 1928, two copies of "Southern Aviator" dated in 1930 and a directory entitled "Airports" for the year 1936.

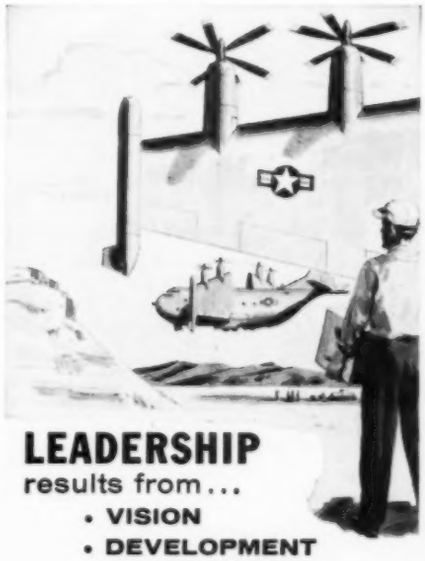
I have no particular idea why I stored those away, but re-reading them and envisaging again the eight-year span they cover develops a striking picture of the changes that have occurred in aviation in the last quarter century. At the same time some conclusions can be drawn which have a direct bearing on the airport situation as it exists today.

Take the advertisments in "Popular Aviation" for July, 1928. Most conspicuous were those for air colleges and for manufacturers of airplanes. One of the schools even had a two-page spread. Then there were full-page ads for goggles. You might be interested in some of the aircraft advertised. There were Fairchild, Swallow, Cessna, Travel Air, Eaglerock, American Eagle ($2,885 FOB Kansas City), Ryan Brougham ($12,200 FOB San Diego), Mohawk Pinto, Waco and the Viking.

Emphasis was on airplane sales and training. Contrast that with today's periodicals. Still the aircraft sales but the training ads are noteworthily inconspicuous.

But when you riffle through the Airport Directory of 1936 to look at the pictures of the airports shown therein you begin to see the difference between airports in those days and the airports of today. I think there is a lesson there. The most conspicuous feature in nine and one-half out of ten of the airports pictured is that the item most certain to be found is a hangar and there are few aircraft shown outside except when the pictures obviously portray a fly-in. There are few runways, fewer taxi-strips, only small terminal development. Some of the runways are gravel, some cinders and some of more modern materials. Even the latter were noticeably short. Birmingham, Alabama, is described as having one 3,700 foot runway of asphalted concrete. Steadham Acker was the manager, remember? Washington-Hoover was described as soil and sod. Kansas City had four cindered asphalt-treated runways. Brownsville had two gravel runways.

That was twenty years ago. Then came the DC-2 and the DC-3 and Lock-



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heed Lodestar. Airports began to assume different shapes and forms. Prior to that time the airport business had been built on a foundation of general aviation. The big expenditures for runways, taxi-strips, aprons and terminal facilities began to form and take shape and require investments far greater than land and sod and hangars.

If air transportation was to have a future in the air carrier and in the utilitarian business field, travel by aircraft must become commonplace and lose the aura of adventure which had surrounded it. In doing that in the twenty years that have elapsed since 1936, aviation has required that more and more money be spent on airports. As these grew greater, the debt service began to be a measurable item in civic budgets. During the last quarter century there has also been a strong movement toward business administration of cities and counties, the agencies which usually own and operate airports.

Professional administrators began to look carefully at income and outgo. Self-sustenance of airports began to be a strong consideration in judging the effectiveness of management. Significant is an item in Southern Aviator of August, 1930, which is captioned "Tyler Field Paying Expenses." That was Tyler, Texas, and the field had only been in operation three months.

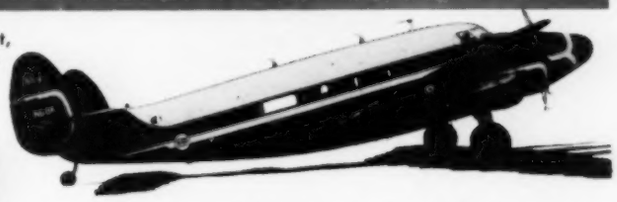
I don't imply that there was anything wrong in the belief that airports should pay their way. Where difficulty began to creep in was the point where that belief became confused with the idea of municipal profit. If service to all the public and facilities for all the elements of civil aviation had been considered, too, the income motive would not have worked a hardship on

TELEVISION FLYING LESSONS are being used at Wilmington, Delaware, by Atlantic Aviation Service with Actress Lani Logan learning to fly a Piper Tri-Pacer before the cameras. With her above are Atlantic Sales Manager Ed Nilsson and Advertising Manager W. A. Lynch. Piper Aircraft is cooperating.

CONVERSION 105

A LOCKHEED LODESTAR WITH WEATHER RADAR

This Lockheed is lightweight, yet has high performance with all safety features.



Interior of cabin seats 10 passengers, has fold-up tables, berthable sofa.

Cockpit and all radio, navigational and electronic gear was installed by Executive Aircraft—Electronics.

Conversion 105 is a high performance Lodestar featuring the latest Bendix weather radar in the nose. This business aircraft was completely modified by Executive Aircraft Service . . . from the radar in the nose to guaranteed sealed tanks with brazier-head rivets, to the super-fine cabin. This was the third conversion EAS performed for this particular customer. Satisfied customers are our best recommendation.

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anyone. However, hangar rental and operators gas sales have never been as remunerative as airline landing fees and space rentals in terminals. This was true, especially when measured against the ground areas required for service hangars. Not long ago an official of a large city told me that he couldn't spend any money for general aviation because operators only paid the city in revenues a few thousand above the hangar rentals.

To me it seemed that he had lost sight of the factor that most needed consideration — a true and factual measurement of the service deficiencies affecting the users of business aircraft whether locally based or transient and an accurate analysis of the costs involved in their use of the airport and its facilities as compared with the air-carrier facilities and usages. And I don't mean a dreamy study of intangibles. That has its place, too, but it is hard to substantiate.

It would be interesting to see, for example, a study of the per capita revenues accruing to a metropolitan airport from a small airline operating thereon and from a comparable number of passengers hauled in and out by corporate-executive and air-taxi aircraft.

As you have said, we all subscribe to the premise that we do not object to expenditures needed to provide for scheduled aviation, but we don't like to see the fast-growing utility use of civil aircraft penalized.

As for me I think the big cities should reinspect their policies as related to the profit motive and relate their airport expenditures to the actual needs of all the elements of aviation.

Whenever I see a proud statement that an airport has made a substantial sum of profit over expenditures in a month or a year I wonder what the city will do with that money. Will it go back into the airport for better service and facilities or will it go into streets and sewers?

ANSWER: Your letter has been read with interest. Thank you for writing our column for this month.

PRESSURIZED CESSNA

(Continued from page 32)

cluded.

Only design figures have been released so far. These include: 269-mph. top speed at 15,000 ft.; 235-mph. cruising speed using 70% power at 18,000 ft.; 7.25-hr. endurance at 65% power; 1,700-mile range; 535-gal. fuel capacity; 1,600-fpm. sea level rate of climb; 27,500-ft. 4-engine service ceiling; 22,500-ft. 3-engine service ceiling; 13,650-lb. take-off gross; 13,000-lb. landing gross;

Meet Bill Judd, TWA Captain and flyer extraordinary. In his personal plane, **Star of the Red Sea,** (Cessna 180) he took off from New York and flew non-stop to Paris, France, in flying's worst possible weather conditions. Starting 1500 pounds overloaded, he made the flight in only 24 hours. He gives much of the credit to his McCauley Met-L-Matic constant speed propeller.

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AIRLINER MET-L-MATIC FORGED STRENGTH McCAULEY

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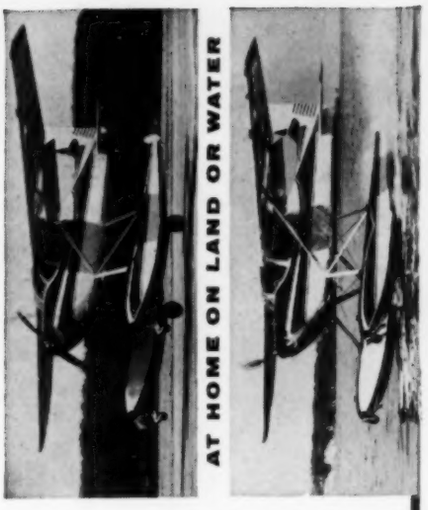
SOLUTION TO STORAGE PROBLEM FOR DEMONSTRATORS, with all hangar space going to customers, was a "plane port" for Lane Aviation Corp., Columbus, Ohio. Structure is same as for T-hangars but sides are open. Chain tie-downs protect against wind. Ideco built the unit.

1,800-ft. take-off distance over 50-ft. obstacle; 2,250-ft. landing distance over 50-ft. obstacle; 55-ft. span, 41.55-ft. length; 16.4-ft. height; 40.1-lbs.-sq.-ft. wing loading; 10.6-lbs.-hp. power loading; aspect ratio of 9; 12.7-ft. wheel base; 18.3-ft. tread; 74-in. fuselage width; 84-in. fuselage height.

No empty weight has been released but useful load of about 4,500-5,000 lbs. would fit the figures. It can accommodate up to 11 seats including crew of two, but crew and 7 passengers would be the normal luxury provision, using four chairs and a 3-place divan in the cabin, with galley and toilet compartments.

The prototype was rolled out finished in two tones of green and a white top, its striping adding an appearance of length to its stubby fuselage, which is 13.5 ft. shorter than its span. The interior was bare, but the turbine refrigeration had chilled it to air-conditioned comfort inside only 3 minutes after starting, while air temperature on the ramp was up close to 100 deg. in a hot sun. This, with pressurization, heating and soundproofing, will be the 620's major selling point. ★ ★ ★



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CESSNA 180 ON Edo FLOATS

Your Cessna 180 on Edo amphibious floats gives you great new utility you never dreamed possible before. Suddenly, you have a million landing places—every lake, harbor, river, plus regular airports.

And you get such wonderful performance with the Edo 180 . . . over 135 mph cruise, fast take-off from water, the nicest handling characteristics on land. At last a really nimble amphibian!

Investigate how Edo amphibious floats will improve the usefulness of your Cessna 180. They're easy to install, easy to remove during seasons when water operations may not be desired. Available for prompt delivery. See your Cessna distributor or write for float brochure.

Standard Edo floats available for all single engine Pipers, Cessnas and many other types.

Edo Model 289 amphibious floats feature retractable, wide-tread, four-wheel gear each with long-travel oleo struts. Surprisingly little weight penalty.

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Smart appearance as well as dependable performance is important in business aircraft. That is why business planes in ever increasing numbers are being repainted at Ohio Aviation. Our Paint Department is equipped to handle DC-3's down to the smallest aircraft—on a finishing system that gets your plane back into service with minimum delay. There are no short cuts, here. Complete stripping, etching and surface preparation, and a final spray coat of hot enamel guarantees a smooth, protective glistening coat—as glamorous and beautiful as the original finish.

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Dayton Municipal Airport,
Vandalia, Ohio

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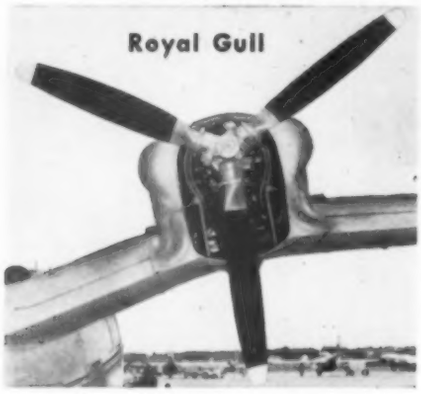

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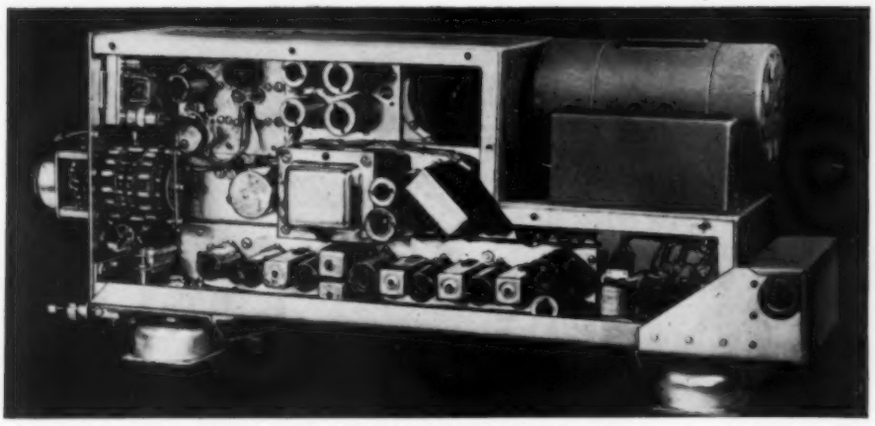

NEW VHF TRANSCEIVER FOR 180 OR 360 CHANNELS is being marketed by Dare, Inc., of Troy, Ohio, to expand its communications and navigation line. It is the Dare DTR-18/36, moderate-priced for business, airline or military aircraft. Frequency coverage is from 118.0 to 135.95 mc. and it will operate as a simplex unit for transmission and reception on the same channel or can be supplied for cross-channel operation. Entire unit mounts on a ½ ATR rack and weighs only 22 lbs. For 14 or 28-volt operation, it has 15-watt transmitter and a crystal-saver circuit uses only 38 crystals for 180 channels and 58 for 360 channels. Only 10 wires connect the unit with its Dare control. Price for 180-channel simplex operation is about $2,500.

LOW AND SLOW

(Continued from page 46)

had taken upon himself to fabricate after finding our missing one where it had fallen on top of the fan housing. He duplicated its leaf spring and added a rib as an improvement so it wouldn't flex so easily. The one from Chicago had meanwhile arrived but out of respect to Lloyd's ingenuity, Bob decided to give the homemade job a whirl. Our take-off at noon found us with a slight tail-wind and no more mountain passes — just good ole flat country all the way home. To top it off, we had a nice iron-compass railroad below which we could ride in the general direction of Wichita. It was so great a set-up we took time out, after crossing the Cimarron River, to land on a sand dune, without displacing a grain of sand, and enjoy the scenery at a

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spot resembling the Sahara. It was relaxing and, flying again, the terrain became better and better across Oklahoma after refueling at Alva. We made Wichita by 5:30 p. m.

We did not want to leave Wichita next morning without first stopping at Cessna Aircraft's new helicopter plant for a look at the new Cessna CH-1 and a visit with the folks there.

Then we were off, but only for a few moments, because the homemade damper let go and we went into an airport and installed the Chicago damper which we carried. It was a cinch to make Kansas City and then Keokuk, winding up in Burlington for the night before hedge-hopping the rest of the way to Chicago and home.

It had been a great trip, this low way by helicopter from California to Lake Michigan. The high road is not for choppers, and neither is the long haul, but Miss Duo-Fast had taken it all in stride, as have hundreds of military and commercial helicopters before her. She's the newest aviation tool for business.

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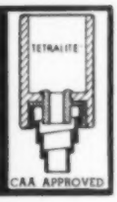

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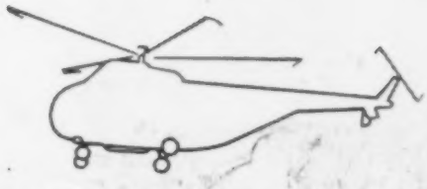

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